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,,	49,		3 from bottom,		Rājas,	,,	Rājās.
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,,	65,		last,		ن	,,	ن
,,	78,		7 from bottom,		chaitya,	,,	caitya.
,,	89,		27 and elsewhere,		Çāntipārā,	,,	Tāntipārā.
,,	90,		2,		Ditto,	,,	Ditto

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PLATE VI

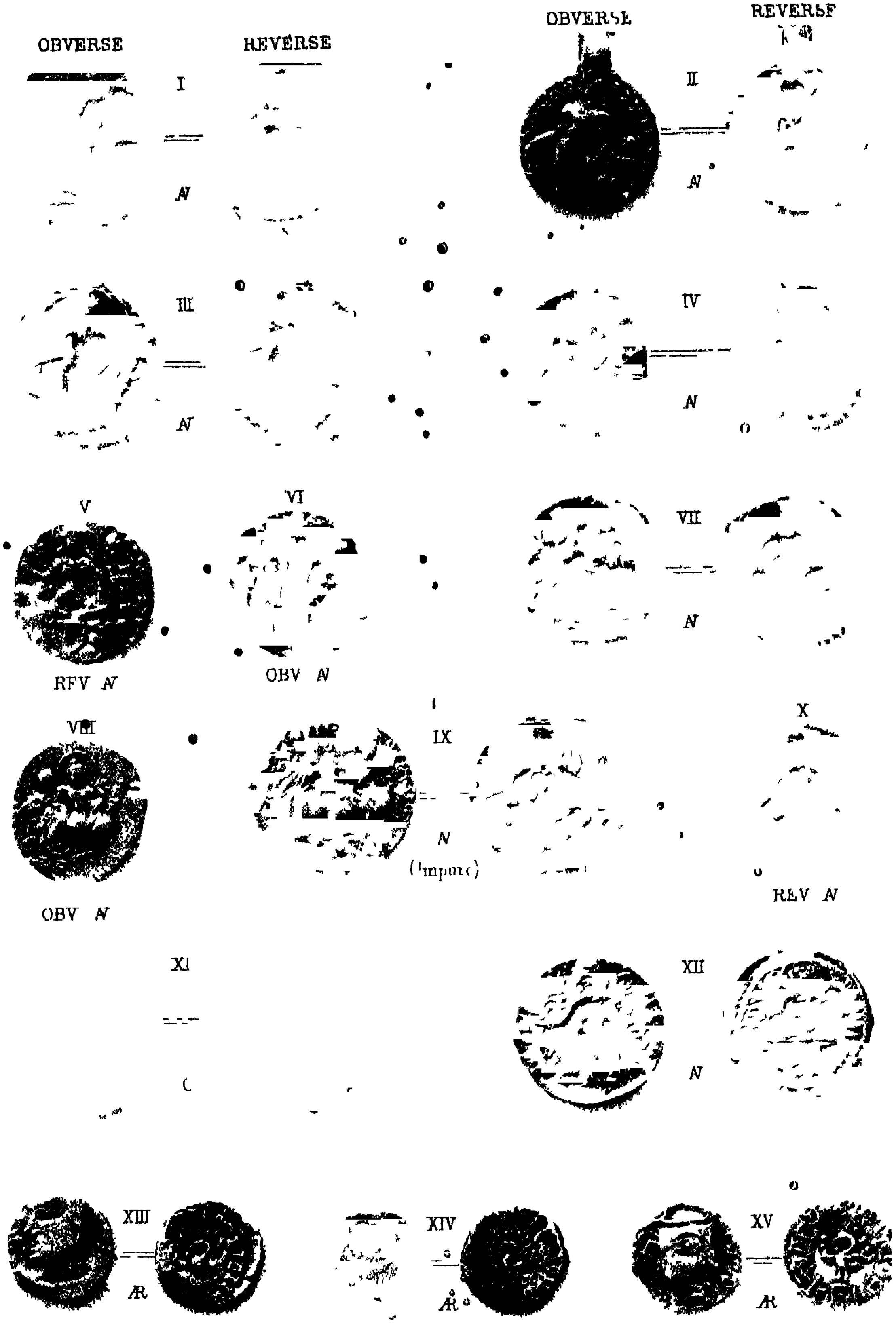

Photo etching

Survey of India Offices Calcutta April 1895

COINS OF THE GUPTA PERIOD

Under orders of the Council the following system of transliteration will be adopted for the future in all publications of the Society. Authors of papers for the *Journal*, Pt I, are particularly requested to adhere to it in their contributions.

A. FOR THE DĒVANĀGARĪ ALPHABET, AND FOR ALL ALPHABETS RELATED TO IT

अ *a*, आ *ā*, इ *i*, ई *ī*, उ *u*, ऊ *ū*, ऋ *ṛ*, ॠ *ṝ*, ऌ ए *e*, ए *ē*,
ओ *o*, ओ *ō*, ऐ *ai*, औ *au*, ं *ṁ*, ँ ˜

क *k*,	ख *kh*,	ग *g*,	घ *gh*,	ङ *ŋ*
च *c*,	छ *ch*,	ज *j*,	झ *jh*,	ञ *ñ*
ट *ṭ*,	ठ *ṭh*,	ड *ḍ*,	ढ *ḍh*,	ण *ṇ*
त *t*,	थ *th*,	द *d*,	ध *dh*,	न *n*
प *p*,	फ *ph*,	ब *b*,	भ *bh*,	म *m*
य *y*,	र *r*,	ल *l*,	व *v*,	(ळ *ḷ*)
श *ç*,	ष *ṣ*,	स *s*,	ह *h*	

In the above the *virāma* has been omitted for the sake of clearness.

In Modern Vernaculars only; ड़ may be represented by *ṛ*, and ढ़ by *ṛh*.

Avagraha is to be represented by an apostrophe, thus सो ऽपि *sō 'pi*. *Visarga* is represented by *ḥ*, *Jihvāmūlīya* by *ẖ*, and *Upadhmānīya* by *ḫ*. *Anusvāra* is represented by *ṁ*, thus संसर्ग *saṁsarga*, and *anunāsika* by the sign ˜ over the letter nasalized, thus अँ *ã*, आँ *ā̃*, and so on. The *udātta* accent is represented by the sign ´ and the *svarita* by ^. Thus, अ॒ग्निः *agníḥ*, ज॒नि॒ता *janitá*, क्वा॑ *kvâ*, क॒न्या॑ *kanyâ*. The *anudātta* accent may be represented by `. Thus, ते अ॒व॒र्ध॑न्त *tè àvardhanta*.

B. FOR PERSIAN (INCLUDING ARABIC WORDS IN PERSIAN) AND HINDŪSTĀNĪ

(The system is not applicable to Arabic when pronounced as in Arabic-speaking countries) :—

Vowels.		Consonants.		Sounds only found in Hindūstānī	
ا	a	ب	b	بھ	bh
آ	ā	پ	p	پھ	ph
اِ	i	ت	t	تھ	th
اِی	ī			ٹ	ṭ
اے	ē			ٹھ	ṭh
اُ	u	ث	s̱		
اُو	ū	ج	j	جھ	jh
او	ō	چ	c	چھ	ch

Vowels.		Consonants.		Sounds only found in Hindūstānī.	
اَی	ai	ح	ḥ		
اَو	au	خ	k̲h̲		
		د	d	دھ	dh
				ڈ	ḍ
				ڈھ	ḍh
		ذ	z̲		
		ر	r	ڑ	ṛ
				ڑھ	ṛh
		ز	z		
		ژ	z̲h̲		
		س	s		
		ش	s̲h̲		
		ص	ṣ		
		ض	ẓ		
		ط	ṭ		
		ظ	ẓ		
		ع	'		
		غ	g̲h̲		
		ف	f		
		ق	q		
		ک	k	کھ	kh
		گ	g	گھ	gh
		ل	l		
		م	m		
		ن	n		
		ں	when representing *anunāsika* in Dēva Nagarī, by ~ on the preceding vowel		
		و	w (or rarely v)		
		ه	h		
		ی	y		

Hamzah ء (where necessary) '

The ل of the article ال in Arabic words should be assimilated before the solar letters and the vowel *u* which often precedes the article and absorbs its vowel should remain attached to the word to which it belongs Thus— اقبال الدولہ Iqbalu-d-daulah.

Tanwīn may be rendered by *n*—e g, *ittifāqan* *Alif-i maqsūrah* should be rendered by *a*

Final ہ need not be written in Persian and Hindustānī words, but should be written in Arabic words

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Part I.—HISTORY, LITERATURE, &c

No. I.—1894.

Note on a Chinese inscribed slab lately dug out of St John's Churchyard, Calcutta—*By* THE REV. H B HYDE, M A.,

[Read, December, 1893]

The Chinese inscription, of which I exhibit a transcription, and also a paper-rubbing, occurs on a slab of agglomerate lava in St. John's Churchyard Mr T H Holland, A R.C.S, F G S, of the Geological Survey, has lately read a paper to us upon this piece of stone,[1] geologically considered, and tells us that it belongs to a formation found in the neighbourhood of the Corea, and elsewhere on the Chinese coast The slab measures 2 ft 8½ in. by 2 ft 5 inches, and is 6 in. thick It was recently dug out of the ground on excavating the earth around the Speke monument

I am informed by the Verger of St John's that he had seen the slab before its present discovery In the year 1886, in the process, he thinks, of preparing flower-beds at a spot on the north side of the Church, within the limits of the old burying-ground, four brick graves were discovered at a depth of about 2½ feet. These graves, he said, lay side by side, and were covered by large square tiles of great thickness, and upon these tiles were lying a number of flat stones. The Chaplain ordered all to be covered up at once, but one of the flat stones being displaced was removed to the place where the inscribed slab recently was found. A flower bed being about that time made around the Speke monument, the stone was buried where it lay, to get rid of it. No one at the time took any particular notice of the stone, and certainly the existence of an inscription upon it was unsuspected. He says that the slab now unearthed was the one then buried

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[1] Vide *Journal*, Vol. LXII, Part II, p 164

The face of the stone still retains the remains of an original high polish, and upon this has been incised with a chisel an inscription of about 270 Chinese characters, arranged, as it were, in two pages or two series of columns Of this inscription the following translation has been made by Mr E F Taylor, Commissioner of Customs at Shanghai, and at present with the Chinese Commission at Darjeeling.

It shows that the slab must have been the Foundation stone of a fort erected by the Manchu Tartars on the Island of Chusan while they were subduing the Chinese of the Ningpo District

"Record (of the building) of the coiled dragon and crouching tiger fortification —

"In the 8th year of the 1st Emperor (Shunchih) of the Ching (present Manchu) dynasty (*i.e.*, about 1652 A D.), the Imperial troops marched to the conquest of Wêng Chon, and in the first battle Juan Chin (probably the Chinese chief or general of the district) was captured In the second engagement the city of Chon (on the island of Chusan) was reduced. At that time our ships were in such numbers that they spread to the horizon, and our banners obscured the sky The Governor Ch'ên [leading the Manchu troops] with Ku-sai[1] Chin and Liu, Beileh[2] wu, Marshal T'ien and General Chang, having offered oblations of wine on the shore, ascended the two hills and gazed around them; when H E. Ch'ên said—'This is a remarkable spot specially designed by heaven, 'how unlucky for our foe that he did not observe its advantages Had 'he posted troops in ambush on these two hills, and defended them on 'every side with big guns, our soldiers, though brave, could never have 'passed over But we must profit by the experience of his disaster. 'The whole conditions of the locality mark it out as a place to be 'defended with fortifications and guns in position.' H. E. Ch'ên then turning to Chang said 'You must draw up the necessary plans.'

---

[1] Manchu title. (?) 'Guardians of the passes'

[2] Manchu title.

Then turning back and speaking to Ch'iên (that is the writer of the inscription), he said, 'You will take charge of this work.'

"In two months the fortification was completed The hill to the east is wavy in outline (the coiled dragon), and with eminences and depressions, while that to the west is gently sloping (the crouching tiger). On these two hills, then, was built the Tai fortification, which may be likened to a coiled dragon and crouching tiger. When the dragon is coiled and the tiger crouched, all is quiet, the whole universe is at peace. But their power to move and act is latent, though concealed Restrained potentiality and hidden might, such is the outward appearance of the fortification to intimidate the enemy from afar is its function. Soldiers may not be called into action for 100 years, but no day must pass without their being in readiness Only have your troops ready and you may never have occasion to employ them. This is the idea (conveyed by the imagery) of the coiled dragon and the crouching tiger Written by the Pacificator (Manchu title) of Chusan and Ningpo, Senior Brigadier (Manchu title) of the Banner troops (*i. e*, Manchus from Peking) Jui Ch'ien"

Mr Taylor, writing from Darjeeling, remarks "I have no means here of giving the proper translations of the Manchu titles." He says, "The Chinese is good and classical, and evidently composed by a scholar"

In the *Journal* of the Royal Geographical Society for 1853, is a plan, and a detailed description by Sir J F Davis, Bart., of the Island of Chusan, but it contains no mention of the fort to which the Inscription relates It is only to be conjectured that the fort, evidently an earthwork, was demolished by the British troops during our occupation of the island from 1840 to 1846; while we held the island as a guarantee for the fulfilment of the stipulations of the Treaty and that the battalion of native troops from Bengal, which formed part of our expedition, which attacked the island in 1840, brought back with them, on their return, this foundation stone. But if they did so, how it came to be buried in the Cathedral Churchyard, instead of being exhibited in some public place, or lodged in the Asiatic Society's Museum, is a question not yet solved

On the Relationship between Tibetan Orthography and the Original Pronunciation of the Language.—By THE REV. F. B SHAWE, *Moravian Missionary in Ladak*

[Read, November, 1893]

[*Note*—In the MS of this paper Jaeschke's system of transliteration was followed For typographical reasons, however, some slight changes proved necessary, which will, I hope, not be confusing to the student accustomed to use Jaeschke's system, and which are not intended to be understood as a new system of my own. For scientific purposes I consider Jaeschke's system to be the best of all I have hitherto met with.

The transliterations are shown in the following table —

ཀ་	*ka*, k or c.
ཁ་	*k'a*, aspirated *k*
ག་	*ga*, hard English g, when a mute prefix represented by γ
ང་	*ṅa*, ng (pang).
ཅ་	*ča*, ch.
ཆ་	*č'a*, aspirated *ča*
ཇ་	*ja*, j
ཉ་	*nya*, French gn (campagne).
ཏ་	*ta*, t.
ཐ་	*t'a*, aspirated *ta*.
ད་	*da*, d
ན་	*na*, n.
པ་	*pa*, p
ཕ་	*p'a*, aspirated *pa*
བ་	*ba*, b
མ་	*ma*, m.
ཙ་	*tsa*, ts (parts).
ཚ་	*ts'a*, aspirated *tsa*
ཛ་	*dza*, ds (guards).
ཝ་	*wa*, w
ཞ་	*zha*, s (leisure).
ཟ་	*za*, z (zeal).
འ་	*.a*, (basis for vowels)
ཡ་	*ya*, y (yard)
ར་	*ra*, r
ལ་	*la*, l
ཤ་	*śa*, sh
ས་	*sa*, s (some)
ཧ་	*ha*, h
ཨ་	*'a* (basis for vowels).

ḍ, ṭ, etc., are cerebrals

Pronunciations spelled phonetically are enclosed by asterisks.]

It is well-known that one of the great difficulties presented to the student of the Tibetan language is the pronunciation Whilst there is no essential difference of opinion as to the articulation of each letter when taken individually, the greatest possible variety of pronunciation prevails as soon as letters are combined into words. The dialectical divisions and sub-divisions are almost all, apparently more or less at variance with the orthography, most of all in the central provinces U-Tsang (དབུས་གཙང་). When, *e g*, སྤྱོད་པ་ *spyod-pa*, is pronounced **čö-pa*,* སྨྱོན་པ་ *smyön-pa* is pronounced **nyöm pa*,* དབྱར་ *dbyar* is pronounced **yar*,* བཅོམ་ལྡན་འདས་ *bčom-ldan-ₒdas* is pronounced **čom-dan da*,* as is the case in the central provinces, the student can easily get the idea, that the orthography, which now stands in the remotest possible relationship to the pronunciation, never did to any reasonable extent correspond to the spoken word This opinion has indeed been expressed, of late years—unless I misunderstand him—by Babu Sarat Chandra Dás,[1] who is acquainted particularly with the central dialects just referred to

Inquiries into the phonetics of the Tibetan language have been made, besides by Schiefner, Lepsius, and Csoma de Koros, notably by Jaeschke, who brought to bear on the matter an ear trained by the study of many languages to distinguish the smallest variations of pronunciation, coupled with an infinite patience in continually revising and comparing apparently well-ascertained facts. Jaeschke embodied the results of his observations in an essay "Ueber die Phonetik der Tibetischen Sprache"[2] and in the "Introduction" to his "Tibetan-English Dictionary."[3] The following remarks are based upon these two essays

My object, however, is not, as was Jaeschke's, to enquire into the whole question of Tibetan phonetics, but simply to bring together what evidence we seem to have, especially in the western dialects, as to the original relationship of Tibetan spelling and pronunciation. An absolutely conclusive argument on this point cannot at present be given To attempt it would pre-suppose an exhaustive practical and scientific acquaintance with the whole system of Tibetan dialects, besides Chinese and

---

[1] S Ch D, "The Sacred and Ornamental Characters of Tibet," *J A S B*, 1888, Pt I, No 2, p 43 —"It does not appear to me, that the Tibetans ever pronounced their words as they wrote them"

[2] In the "Monatsbericht der Königl Akademie der Wissenschaften zu Berlin," 1866 Re-printed as a pamphlet

[3] London, 1881 —The labour involved in compiling the invaluable "Phonetic Table" on pp XVI—XXI can only be appreciated by those who have attempted to trace a few words through dialectical variations often quite imperceptible to the untrained ear of a newly arrived foreigner

Sanskrit, in order to be able to follow the influences exerted by these languages, especially by the former At the present stage of our acquaintance with Tibetan, such comprehensive knowledge is an impossibility I confine myself therefore chiefly to the western dialects and the internal evidence of the classical book-language, referring to the eastern and central dialects only when comparison is necessary

Briefly expressed, the peculiarities of the usual modern pronunciation are —1, A quite abnormal number of mute consonants, both at the beginning and end of the syllable 2 Modulation of vowels, apparently dependant on the elision of consonants 3. A large number of compositions of consonants pronounced identically, many of them becoming cerebrals.

As the tendency of all languages is to tone down or elide all harsh sounds, the fact that there are many mute consonants need not *in itself* cause surprise We know from European languages, *e. g*, French and English, that such apparent vagaries in modern pronunciation are quite explicable, and present no reason for surprise to the student of the history of these languages The modification of vowel sounds is also a well-known process But the wholesale smoothing away and elision of consonants, which has taken place in Tibetan pronunciation, is, to say the least, of a sufficiently startling character. The rules which have governed such changes in other languages do not seem to hold good in this case In numberless cases the consonants seem to have quite lost the power they originally appear to have had, so that the pronunciation now affords scarcely any clue to the orthography. Still, arguing by analogy, it must be granted, that the probability is in favour of the original orthography really representing the original pronunciation Very cogent reasons must be brought forward to induce us to abandon this position, indicated as it is alike by common sense and our knowledge of the development of other languages.

In dealing with this question two great peculiarities of the Tibetan language must be borne in mind. One is, that the Tibetan language stands quite isolated, and allows of no comparison with other languages from a common stock. The other peculiarity is, that for us the Tibetan language not only suddenly comes into existence as a written language, but that since the invention of the alphabet by *T'on-mi Sam-bho-ṭa* in the 7th century A D, it has undergone no alteration in its character as a written language [1] This is no doubt owing to the fact, that Tibetan literature had its beginning in the translations of the Buddhist canon, nominally the religious norm, even at the present day, for the overwhelming majority of the Tibetan-speaking race.[1] The restraining influence on the language exerted in Christian countries by a universally accepted translation of the Bible is well-known, in Tibetan we have a similar work standing at the very beginning of literature. Consequently, whilst in most languages the gradual development of orthography and pronunciation can be traced by a more or less complete chain of literary productions, Tibetan orthography has remained stationary, whilst the pronunciation has undergone great modifications For, so far from finding any remarkable facts pointing to an original discrepancy between orthography and pronunciation, we have a series of observations which all point to the conclusion that the latter has, either gradually or suddenly, divorced itself from the former.

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[1] This does not imply that absolutely no change or development has taken place, for it is possible to make three or four broad distinctions in style and construction. But a student of Tibetan can read an ancient and a modern book with the aid of one and the same grammar and dictionary, whilst, *e g*, the "Brut" and even the "Canterbury Tales" require special study with special appliances

These observations are made both in the literary language (ཆོས་སྐད་ *č'os-skad*) and in the popular dialects (ཕལ་སྐད་ *p'al-skad*).

Turning our attention first to the *literary language*, we can conveniently enquire into the original relationship between orthography and pronunciation by investigating the homophones and the grammatical particles or post-positions, which supply the place of flexions

On hearing Tibetan spoken, the student cannot fail to be struck by the large number of homophones In some cases the homophonous appearance is genuine, *i e*, there are a number of words identical in spelling and pronunciation, but differing in meaning. In the majority of cases, however, an enquiry into the orthography reveals the fact, that many apparent homophones need not necessarily be homophonous Whilst identical to the ear, they are orthographically clearly distinguished to the eye These homophones resolve themselves into two classes—those having an identical or similar root, and those having differing or dissimilar roots

The first class consists mainly of verbs. In the literary language the active and neuter forms of the verb are rarely identical, whilst no difference is at present made in pronunciation We have, *e. g*, the neuter verb འགྲུབ་པ་ *ₒgrub-pa* "to be accomplished," with Perf གྲུབ.

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[1] It is also interesting to note that the influence of Buddhism has secured the adoption of Buddhist terms for the commonest things, *e. g.*, the only words in use for "world" are སྲིད་པ་ *srid-pa*, (*i. e*, "*bhava*"—of very rare occurrence) and འཇིག་རྟེན་ *ₒjig-rten*, (*i e*, "receptacle of the perishable,"—the common term), both of which are evidently of Buddhist origin. What word was in use previous to the introduction of Buddhism?

grub, the corresponding active verb "to complete" is སྒྲུབ་པ་ *sgrub-pa*, with the Perf. བསྒྲུབས་ *bsgrubs*, the Fut བསྒྲུབ་ *bsgrub*, and the Imper. སྒྲུབ(ས)་ *sgrub(s)* Here we have at least five different orthographical forms, all derived from the same root and all pronounced alike **dup.** Again འབྱོར་བ $_{o}$*byor-ba*, neut. "to adhere to," and སྦྱོར་བ་ *sbyor-ba*, act, "to affix," both pronounced **jor-wa** (or sometimes **ǰor-wa**). The neuter form has the alternative reading འབྱར་བ་ $_{o}$*byar-ba*, whilst the Perf. and Fut of the active form is སྦྱར་བ་ *sbyar-ba*, both pronounced **jar-wa** Again —འདུ་བ་ $_{o}$*du-ba*, neut. "to come together," Perf. འདུས་ $_{o}$*dus;* སྡུད་པ་ *sdud-pa*, act "to assemble," Perf. བསྡུས་ *bsdus*, Fut. བསྡུ་ *bsdu*, Imper བསྡུ་ *bsdu* or བསྡུས་ *bsdus*. The pronunciation in central Tibet of five of those forms is identical, **du** Slightly different is the case of the verb འཇུག་པ་ $_{o}$*jug-pa*, which is both neuter "to enter" and active "to put into" The neuter verb has Perf ཞུགས་ *zhugs*, whilst the active verb has Perf བཅུག་ *bčug*, Fut གཞུག་ *γzhug*, Imper ཆུག *č'ug* In this case the identical orthography of the Present gives way to a marked difference in the Perfects, whilst the neuter Perf. (*zhugs*) and the active future (*γzhug*) are identical in pronunciation, **γzhuk** Again slightly different is གཏོང་བ་ *γtoń-ba* "to give," Perf བཏང་ *btań*, Fut གཏང་ *γtań*, both Perf and Fut are pronounced "*tań*"

Such examples could easily be amplified, the "list of the more frequent verbs" in Jaeschke's Grammar[1] suggests many more But the above will suffice to illustrate the remarkable fact, that though homophonous verbal forms are frequent, they are almost invariably carefully differentiated by the orthography The question at once arises, what the reason of this peculiarity may be. Do these detailed orthographical distinctions rest upon the basis of actual articulation current at the time the language became literary, or are they merely grammatical refinements? Though not probable, it is certainly possible, that the latter may be the case. The intricacies of Buddhist philosophy require for their correct expression accurately distinguishable verbal forms, and it is not impossible that the translators, accustomed to the rich structure of Sanscrit, found themselves obliged to make artificial distinctions, where the language at their disposal did not supply them They might therefore have adopted the use of mute prefixed and superscribed letters to make such distinctions perceptible at least to the eye, whilst they were then, and have since usually remained, imperceptible to the ear. At the same time it must be remarked, that neuter and active verbs are otherwise almost always distinguished by the use of two of the three forms of the guttural, palatal, etc., letters, _e. g._, འདོན་པ་ _ₒdon-pa_, act "to cause to come forth," འཐོན་པ་ _ₒt'on-pa_, neut. "to come out" It seems therefore probable that such distinctions were originally inherent in the language.

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[1] 2nd Ed, p 99 and ff

Turning to the second class, homophones from different or dissimilar roots, we find some verbs here also, _e. g._, འབྱིན་པ་ _ₒbyin-pa_ "to draw out" and སྦྱིན་པ་ _sbyin-pa_ "to give," both pronounced alike in most dialects as *_jin-pa_,* whilst they are derived from totally different roots, the neuter form of _ₒbyin-pa_ being _ₒbyuń-ba_. Further རྨོ་བ _rmo-ba_ "to plough," སྨོ་བ _smo-ba_ "to say," both pronounced *_mo-wa_,* ཁད་པ་ _k'ad-pa_ "to approach," འཁད་པ་ _ₒk'ad-pa_ "to stumble," both pronounced *_k'at-pa_* or *_k'a-pa_* Very striking are བྱེད་པ་ _byed-pa_ "to do," རྗེད་པ་ _rjed-pa_ "to forget," འབྱེད་པ་ _ₒbyed-pa_ "to open," all three are quite distinct in etymology, but the pronunciation of all is usually identical, _viz_ *_jet-pa_* or *_jĕ-pa_.* The greater number of homophones of this class are, however, found amongst the substantives So ལྟང _ltań_ "bale of goods," སྟངས་ _stańs_ "gesture," both usually pronounced *_tań_,* རྟེའུ་ _rte-u_ "foal," སྟེའུ་ _ste-u_ "small adze," both pronounced *_teu_,* བཙའ་ _btsa_ "rust," རྩྭ་ _rtswa_ "grass," རྩ་ _rtsa_ "root," all pronounced *_tsa_* Also ཡང་ _yań_ "again," གཡང་ _γyań_ "happiness," both pronounced *_yań_,* ཡར་ _yar_ "upwards," དབྱར་ _dbyar_ "summer," both pronounced *_yar_,* ལུང་ _luń_ "precept," ཀླུང་ _kluń_ "river," རླུང་ _rluń_ "wind," ཀླུངས་ _kluńs_ "cultivated land," all usually pronounced *_luń_,* ལོག་ _log_ "back" (adv), གློག་ _glog_ "lightning," ལོགས་ _logs_ "side," ཀློག་པ་ _klog-pa_ "to read," རློག་པ་ _rlog-pa_ "to destroy," སློག་པ་ _slog-pa_ "to turn," all pronounced *_lok_* or *_lo_,* ནམ་ _nam_ "when?" གནམ་ _γnam_ "heaven" རྣམས་ _rnams_ (sign of the plural), all pronounced *_nam_* In all these cases it can hardly be maintained, that there was any absolute necessity for introducing a different spelling for the same sounds, as the context would clearly show which signification was intended.

Still more important are a few homophones, which may be used in addressing superiors or signify something common, according to the manner of spelling Such is, _e g_, ཆག _č'ag_ "dry fodder, grain" and ཚག

p'yag "hand," both pronounced **č'ak**. ཕྱག་ *p'yag* is used in numerous expressions of politeness, the Buddhas and saints being reverenced with the phrase *p'yag ₒt'sal-lo*. The original absolute identity of these words can scarcely be considered probable. Still less is the identity probable in the case of རྗེ་ *rje* "lord" and མཇེ་ *mje* "penis," both now pronounced alike, **je**. The former word is applied only to deities, higher lamas, and laics of a very high rank. Can we suppose that such a word can originally (contemporaneously with the introduction of the alphabet) have been homophonous with a word having an obscene signification?

In considering the grammatical particles or post-positions a few examples will suffice. According to rule, the post-position of the instrumental case is to be spelled *kyis* after the letters *d*, *b*, *s*, and *gyis* after *n*, *m*, *r*, *l*. Similarly the genitive case is indicated by *kyi* after *d*, *b*, *s*, and by *gyi* after *n*, *m*, *r*, *l*. The reason for these changes in the ending is evident. According to Tibetan pronunciation final *d*, *b*, *s* are essentially hard, and consequently occasion a hard pronunciation of the initial consonant of the following syllable; *n*, *m*, *r*, *l* are soft, causing a corresponding softening of the following letter. At the present day མི་རྣམས་ཀྱི་ *mi-rnams-kyi* "of the men," and མི་རྣམས་ཀྱིས་ *mi-rnams-kyis* "the men" (instrum.) are pronounced **mi-nam-gyi** and **mi-nam-gyis,** i. e., the elision of the *s* and consequent appearance of a soft consonant at the close of the previous syllable at once occasions a corresponding softening of the following letter. But although this is always the case in speech, it is practically never the case in writing. On the contrary, the accuracy with which these forms are written is remarkable, and a MS. in which they are not correctly written will show other marks of being the work of an unusually illiterate copyist. In close analogy, the word ཡང་ *yań* "and" becomes ཀྱང་ *kyań* after the letters *g*, *d*, *b*, *s*, a change rigorously observed in writing, although, *e. g.*, an educated man unhesitatingly reads ཟུར་ནས་ཀྱང *zur-nas kyań* as **zur-na yań**. Similar variable endings in connection with verbal forms are as regularly adhered to in writing as they are discarded in reading and daily speech.

The above observations on the literary language may be summed up in the following:—Whilst many identically pronounced words are spelled identically, many more are spelled in a more or less widely differing manner in accordance with the differing significations, and whilst certain rules of the language cause a modification in pronouncing certain syllables, the identical rule prevents the modification from taking place in writing. This seems to speak most strongly in favour of the theory, that the orthography corresponds to the actual pronunciation of the language at the time of the invention of the alphabet. Or is it probable, that the language originally contained such a large proportion of pure homophones, and was reduced to the necessity of naming the most widely different things by the same sound? Such is to some extent the case in Chinese, where, however, the practice of intoning or singing pronunciation has made a way out of ensuing difficulties. In Tibetan, however, only the rudiments of this method can be traced and seem to be due to Chinese influence.[1] Nor do the high and low tones now in use in the Central Provinces materially reduce the number of homophones. Or is it, thirdly, conceivable, that *T'on-mi Sam-bho-ṭa* and his successors deliberately introduced all these multitudinous variations in spelling? The language existed before the alphabet, and an arbitrary fixation of the orthography would have been a failure. An attempt has lately been made in Germany to approximate, by Act of Parliament, the orthography to the modern German pronunciation (a very much simpler task than that of the early Tibetan literati), but the experiment can hardly be considered a success. The experts were unable to agree, and the result is, that what is orthographically correct in Prussia, is possibly wrong in Bavaria. This would have been the case to a much greater degree in Tibet, where each translator would have been at perfect liberty to form his own orthography. Such arbitrary attempts to regulate a language cannot succeed, unless all learning is in the hands of a small and select caste, bent on securing its own privileges. We find no traces of any such attempt on the part of the early propagators of Buddhism in Tibet; on the contrary, they seem to have encouraged popular education by all means in their power. And even supposing that the *lo-tsa-ba* had introduced differentiating orthography, why were not all the homophones thus treated? What ideas could have governed the choice they made? Again, the usage of grammatical forms as shown above, is evidently the result of actual observation and not of theory. Tibetan grammarians were not sufficiently schooled to make this probable.[2] There seems to be only one way of extricating ourselves from these difficulties, *viz.*, by acknowledging that the orthography as it stands did at the time of its introduction represent the actual pronunciation.

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[1] Jaeschke, Phonetik, p. 166 ff. Dictionary, p. xiii, and Phonetic Table.

[2] A Tibetan Reader in my possession classes the letters as follows:—Guttural *k, k', g, ṅ, .a, h, 'a.* Palatal *č, č', j, ny, ts, t's, dz, zh, y, s'.* Dental *t, t', d, n, z, l, s.* Labial *p, p', b, m, w.* Lingual *r*—a classification that seems very rude and singular to our ideas. Tibetan grammarians also assign either the masculine, feminine or neuter gender to each of the consonants—a piece of mere childish pedantry. V. Jaeschke, Dictionary, s. v. *p'o.*

But against this view is urged, that Tibetans were "unaccustomed to pronounce polysyllables and combinations of several consonants with one vowel."[1] I do not think that this is really the case. At any rate it is hard to see how we are to know this At the present day inhabitants of the central provinces certainly do not pronounce a combination of several consonants with one vowel, but have reduced nearly all combinations to simple forms. This is, however, only habit, for I have convinced myself by actual experiment, that Tibetans of U and Tsang can pronounce most complicated combinations. Nor can it be said, that some combinations are absolutely unpronounceable Jaeschke[2] cites quite as difficult combinations from the Polish language, and the Welsh language offers similar parallels Finally, we have the curious fact, that in some dialects a more or less literal pronunciation actually does take place at the present day, as will be presently shown

We now turn, therefore, to the *dialects* with all the more confidence, as we know what very valuable materials European dialects have supplied to the philologist. Nor are we disappointed, for a slight attention to them reveals some very interesting facts

Taking first the Central Tibetan dialects, which at present stand more at variance with the orthography than any others, we find peculiarities, which seem to be remnants of a former literal pronunciation. According to ordinary usage, the affix *p* in verbs and adjectives is softened into *b*—pronounced * *w* *—after a vowel. In Central Tibet, however, when a final consonant of the root is elided, thus leaving a vocalic tone at the end of the syllable, the *p* is usually not softened, but retains its original form. Thus གཅེས་པ་ *γčes-pa* "beloved" is pronounced **čē-pa** and not, as would be expected, * *če-wa* * (but ཆེ་བ *če-ba* "great" is **če-wa**), བརྗེད་པ་ *rjed-pa* "to forget" is pronounced **je-pa**, whilst འབྱེ་བ་ ${}_{\circ}$*bye-ba* "to open" is pronounced * *je-wa*, * འདོད་པ་ ${}_{\circ}$*dod-pa* "to wish" becomes * *do-pa*,* not * *do-wa* * This persistency of the hard form of the affix is all the more striking as we have seen above that the usual tendency is to soften down such endings in speech, whilst retaining the original hard form in writing

We have, further, a few names which correspond in pronunciation to the orthography. I have several times heard the monastery of འབྲས་སྤུངས་ ${}_{\circ}$*bras-spuṅs* called * *bra-puṅ*,* whilst according to modern pronunciation * *da-puṅ** is the only correct form Then the name of the celebrated lama འབྲོམ་སྟོན ${}_{\circ}$*brom-ston* is usually pronounced * *brom-ton** although * *dom-ton* * would be correct, and is indeed said by the uneducated class of Ladaki lamas [1] Very interesting is the Tibetan name of Vajra-pani ཕྱག་ན་རྡོ་རྗེ་ *p'yag-na rdo-rje* In this name the second and fourth syllables are usually discarded, and the name is then pronounced * *č'ak-dor* * The final *r* is evidently the *r* superscribed on the *j*, which was originally pronounced and has remained attached to the previous syllable At present all knowledge of this etymology is so thoroughly lost, that the name is now often written ཕྱག་རྡོར་ *p'yag-rdor* Exceedingly common in names is the pronunciation **gyam-t'so** for རྒྱ་མཚོ་ *rgya-mt'so*, usually pronounced **gya-t'so**

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[1] S Ch Das, loc cit

[2] Dictionary, p xv

The central dialects contain other examples of cases, when the first syllable of a composite word ends in a vowel, and in consequence a mute prefix belonging to the second syllable becomes audible as part of the first syllable Thus དབུ་མཛད་ *dbu-mdzad* "precentor" should be pronounced * *u dzat,** but is just as often pronounced * *um-dzat* * This pronunciation is considered vulgar in U and Tsang

Examples of this kind are, however, of more frequent occurrence in the western dialects, especially in Ladak, where they are not at all *vulgar Most numerals are invariably treated in this way, *e. g*, བཅུ་གསུམ་ *bču-γsum* "13" is * *čug-sum*,* བཅུ་བཞི་ *bču-bzhi* "14" is **čub-zhi*,* ལྔ་བཅུ་ *lńa-bču* "50" is * *ńab-ču*,* དགུ་བཅུ་གོ་བརྒྱད་ *dgu-bču-go-brgyad* "98" is * *gub-ču-gob-gyat* *. The same thing is common in nouns and adjectives, *e g*, སྣ་མཚུལ་ *sna-mt'sul* "nose" is pronounced * *nam-t'sul* * instead of * *na-t'sul,** as would be required by present-day usage, ཁ་ལྤགས་ *k'a-lpags* "lip" is * *kal-pak(s)* * instead of * *k'a-pak*,* བཀའ་བཀྱོན་ *bka-bkyon* "blame" is * *kap-kyon* * as well as * *ka-kyon*;* ཡ་མཚན་ *ya-mt'san* "wonderful" is * *yam-t'san* * as well as * *ya-t'san*, * མཆོད་རྟེན་ *mč'od-rten* "stupa, tope" is **č'or-ten*,* etc The last mentioned word is important, as at the present day *rten* is always pronounced * *sten* * in Ladak, and we should therefore expect a contraction into * *č'os-ten* * That the *r* has maintained itself under such circumstances is strong evidence that *rten* was originally pronounced as spelled

It is in such compounds that the letter འ་ is still discernible in pronunciation, although it has otherwise completely disappeared from the Ladaki and most other western dialects. Jaeschke[1] mentions དགེ་འདུན་ *dge-₀dun* "the sangha," བཀའ་འབུམ་ *bka-₀bum* "the 100,000 Precepts" (name of a book), and བཀའ་འགྱུར་ *bka-₀gyur* "the translated word" (*i e.*, the Buddhist canon), pronounced respectively ** gen-dun,** ** kam-bum,** and ** kań-gyur,** as probably the only examples. To these, however, must be added མཁའ འགྲོ་མ་ *mk'a-₀gro-ma* "Dakini," pronounced * *k'an-ḍo-ma* *, འོ་འཐུང་ *.o-₀t'uń* "suckling child," pronounced * *om-t'uń* ;* ལྷ་འདྲེ་ *lha-₀dre* "hobgoblin," pronounced * *lhan-ḍe* ,* སྐེ་འཇུས་ *ske-₀jus* "embrace," pronounced * *skyen-jus* ,* སྐུ་འདྲ་ *sku-₀dra* "image," pronounced * *skun-da**, ས་འགུལ་ *sa-₀gul* "earthquake," pronounced **sam-gul** or **sań-gul**, སྡིག་རྭ་འབུ་ *sdig-rwa-₀bu* "scorpion," pronounced **(s) dig-ram-bu* ,* ཆུ་འབུ་ *č'u-₀bu*, "water-insect," pronounced **č'um-bu* * A few more instances may still exist, in which འ་ has become *m* or *n* in the western dialects, thus showing that it is neither a mere orthographical sign nor simply a basis for a vowel,—this latter want being supplied by ཨ་[2]—but that it formerly had a distinctly audible pronunciation

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[1] S Ch Das in the "Journ Buddh Text Soc" 1893, pts 1 & 2, always writes "Bromton," and has informed me that he usually adopts the phonetic spelling of names

In connection with this appearance of otherwise mute letters it is worthy of note that in the Ladaki dialect the stem of the Perf tense in the literary language has become the sole stem of the verb, and is used for the Present and Future, as well as for the Perfect In many cases this peculiarity is not noticeable in pronunciation, and scarcely any, even educated, Ladaki are aware of it. But it occasionally becomes apparent in compounds, *e g*, མགོ་སྐོར་ *mgo-skor* "deceit," is usually pronounced * *go-(s)kor* * In writing Ladaki dialect, however, *mgo-bskor* would have to be written and though the prefix *b* indicating the Perf tense is not ordinarily heard, it becomes audible in the compound substantive, which is pronounced * *gob-skor.**

In all the cases cited the mute consonant re-asserts itself in compounds. In Ladak, however, many consonants, mute in the central dialects, are distinctly heard even in simple words Foremost amongst these is initial *s*, which is almost invariably pronounced in Ladak.[3]

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[1] Phonetik, p 172

[2] Jaeschke, Dictionary, p xiv

[3] The Ladaki go so far in their preference for *s* as to pronounce it even where the orthography does not authorize it རྟ་ *rt* is almost always, and ལྟ་ very often pronounced * *st* * Hence the Ladaki says * *sta* * "horse," * *stags* * "sign, * *stat-čes* * "to deliver," **ma-stogs-te** "besides" Final *s* is also rarely mute

So. སྨན་ *sman* "medicine," སྤུ་ *spu* "hair," སྟར་ག་ *star-ga* "walnut," are all pronounced with an audible *s* in Ladak, whilst the *s* is usually mute in Lahaul The same takes place with other initials, *e g*, བརྡུངས་ཅེས་ *brduńs-čes* "to beat," བལྟ་ཅེས་ *blta-čes* "to look," ལྕགས་ *lčags* "iron," ལྕེ་ *lče* "tongue," are often pronounced * *rduńs*, *lta* (sometimes *sta* !) *lčak*, *lče** respectively, instead of * *duń*, *ta*, *čak*, *če* * as would be usual

Another observation is connected with consonants having subscribed *y*, the so-called *ya-tags* In the ordinary pronunciation both of the central and western dialects, པྱ་ *py*, ཕྱ་ *p'y* and བྱ་ *by* become respectively * *č*', *č*', and *ȷ*.* In Ladak and Lahaul however, ཕྱེད་ *py'ed* "half" is not * *č'et** but * *p'et*, * ཕྱིས་ *p'yis* "duster, rag" is not * *č'is* * but * *p'is*; * also in compounds as ལག་ཕྱིས་ *lag-p'yis* "towel," སྣ་ཕྱིས་ *sna-p'yis* "handkerchief," etc, which are pronounced * *lak-p'is*, (*s*)*na-pis*,* etc. Similarly ཕྱི་པ་ *p'yi-pa* "heathen, non-Buddhist," is not * *č'i-pa* * but * *p'i-pa*, * བྱེ་མ *bye-ma* "sand," is not * *ȷe-ma* * but * *be-ma*, * བྱེད་པ་ *byed-pa* "to make," is not **ȷet-pa** but * *bet-pa* *[1] The verb ཕྱིན་པ་ *p'yin-pa* "to arrive," is unknown in Ladak and Lahaul (?), but is used in Spiti as * *p'in-pa*,* not as * *č'in-pa*,* which would be the regular pronunciation. A similar usage prevails with some words with subscribed *r*, the so-called *ra-tags*, *e g*, the root བྲང་ *brań* is correctly pronounced * *dań* * So in Ladak in the word བྲང་ས་ *brań-sa* "dwelling," pronounced * *dań-sa* * But ཕོ་བྲང་ *p'o-brań* "residence," is pronounced in Ladak very often * *p'ob-rań*,* and ལྷ་བྲང་ *lha-brań* "idol-house," is often pronounced * *lhab-rań* *[2] All the examples cited from the Ladak dialect are not a peculiarity of educated people, who might affect an artificial and refined mode of speech, but are in daily use amongst the illiterate mass of the people

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[1] This word is rather interesting on account of its widely spread use, for * *bet pa* * is in common use in Kunawur, seldom (I believe) heard in Lahaul, and quite unknown in Ladak, except in two or three villages in which it is in constant use

[2] The two examples given are certainly compound nouns, but it will be observed that the analogy with the compounds noted above is not exact In the former mute letters become audible, in these latter cases the labial *b*, has assumed a dental from *d*, and cannot therefore be said to be mute It is just as easy to say * *p'o-drań*, *p'o-dań* or *p'o-rań** as to say * *p'ob-rań*, * and would be in accordance with modern pronunciation. The same irregularity occurs in a place name in Sikkim See J. A. S B 1891 Part 1, No 2, p 69.

The tendency to pronounce usually mute letters is most marked in the most westerly provinces In Purig superscribed and subscribed letters are pronounced exactly as written. Hence we have ཕྱུག་པོ *p'yug-po* "rich," གྲང་མོ *grań-mo* "cold," ཕྲུ་གུ *p'ru-gu* "child," སྒྲོམ *sgrom* "box," གྲི *gri* "knife," བྲི་ཆས *bri-čas* "to write," སྙིང *snyiń* "heart," ཁྲག *k'rag* "blood," the pronunciation of which is **p'yuk-po, grań-mo, p'ru-gu, sgrom, gri, bri-čas, snyiń, k'rak,** whilst **č'uk-po, dań-mo, ţ'u-gu, dom, di, di-čas, nyiń, ţ'ak** would be the usual pronunciation. Of Baltistan it can be said that every letter is pronounced in one way or another Thus[1] བདུན *bdun* "7" is **vdun** instead of **dun,** དཔེ་ཆ *dpe-ča* "book" is **χpe-ča** instead of **pe-ča** (Ladak **spe-ča**) དངུལ *dńul* "silver" is **χńul** instead of **ńul** (Ladak **mul**) In Baltistan and Purig the sign ྭ (*wa-zur*), which has otherwise quite disappeared, but is supposed to be equivalent to *w*[2] has remained in the word རྩྭ *rtswa* "grass," which is pronounced **rtsoa** or **stsoa,**[3] the usual pronunciation being **tsa**

The evidence of the Purig and Balti dialects appears to me to be of the greatest importance, for the following reasons —Firstly, both districts accepted Mohammedanism in lieu of Buddhism at a very early date[4] and by so doing emancipated themselves from the influence of Lhasa and cut themselves off from the development of the other Tibetan races Secondly, from the introduction of Islam probably dates the neglect of literature Tibetan literature was almost entirely Buddhist and was necessarily driven out by the change of religion, whilst Islam had no vernacular literature to offer and made no attempts to provide any[5] At present the inhabitants of Purig and Baltistan are absolutely illiterate.[1] Thirdly, Jaeschke has already drawn attention to the fact, that the dialect of Khams and that of Baltistān are very similar He says.[2] "The prefixes and the superscribed consonants, for the most part, are still sounded at each extremity of the whole territory, within which the language is spoken, both on the western and the eastern frontier, alike in Khams, which borders on China, and in Balti, which merges into Kashmir Moreover, in both localities the same minor irregularities occur, transgressions against an exact rendering of the pronunciation according to the letters, the same frequent transformations of the tenues into the aspiratal, *g* and *d* becoming *γ* or *χ*, *b* becoming *w*. Now, about twenty degrees of longitude separate Balti from Khams."

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[1] Jaeschke, Dictionary, p xix f

[2] Jaeschke, Phonetik, p 162 f

[3] Jaeschke, Dictionary, p xix writes **rtsoá** I have, however, usually heard **rtsóa,** with a distinct accent on the o which represents the lost *wa zur*

[4] The exact or even approximate date is not yet ascertained as far as I am aware Cunningham (Ladak, p 30 f), gives a list of Mohammedan rajahs of Khapalor in Baltistan, the 39th of whom is dated about A D 1410 Cunningham points out that this date coincides with the death of Sikander Butshikan of Kashmir, and is inclined to put the conversion of Baltistan at this date He also points out that some of the persons named amongst the first 39 rajahs are palpably fabulous, and that, therefore, the list is open to objections

[5] The Purig people are well acquainted with the *pre-Buddhistic* legend of King Gesar (cf J A S B 1891, Pt 1, No 3, p 116, Note 13), although they have no written copies of the epic but rely on oral transmission only The folk-lore

On reviewing the observations made as to the dialects spoken by various Tibetan tribes, we find that cases, where spelling and pronunciation are closely allied, in opposition to current rules of pronunciation, are of frequent occurrence. They occur, not in the language of the higher classes, but of the ordinary peasant, and cannot therefore be explained as the result of artificial education. They are found in least numbers in the central dialects, and increase in the dialects east and west of Lhasa in proportion to the distance from that centre of Buddhism Certainly the simplest explanation of these apparent vagaries is, that we have in them relics of a former universal pronunciation, which has in course of time been greatly modified, sometimes out of all recognition We are therefore led to precisely the same view as was arrived at after considering the literary language, *viz.*, that the orthography as it stands represents the pronunciation current at the time of its introduction

But there is yet another piece of evidence as to the original pronunciation of Tibetan, which adds its weight to the arguments already advanced. Jaeschke has noted some most remarkable points of agreement between the supposed original pronunciation of Tibetan and the Bunan language, spoken besides Tibetan and Hindī in Lahaul I give his remarks in an abbreviated translation [3] "According to the assertion of the inhabitants Bunan has had a much greater extension

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of Purig and Baltistan has not yet been thoroughly explored, but the present generation are quite ignorant of the fact that their ancestors were once Buddhists

[1] They know infinitely more about King Gesar than about Muḥammad, and a Purig man once informed me, that Jesus Christ and Muhammad would shortly descend from heaven, and, proclaiming a Jihad, would prepare the world for the second advent of Gesar!

[2] Dictionary, p. xii

[3] Phonetik, p 174 ff

than it at present has, even within the memory of living man. In a slightly different dialectical form it occurs again in a small district* in Kunawur, being separated from Lahaul by large districts where Hindi or Tibetan dialects are spoken. This is the so-called Tibarskad, *v* Cunningham, Ladak, *p* 397 *ff.* As regards grammatical construction and the majority of vocables (especially such primitive words and ideas, which every language must possess previous to the development of civilisation) it certainly does not belong to the Tibetan family. But it has accepted a large number of Tibetan words, and whilst part of these has the original pronunciation corresponding to the old orthography, another part has the now usual pronunciation. The dialect of Tibetan (now) spoken in Lahaul by the same persons (as those who speak Bunan) *is more nearly related by far to the dialects of the surrounding districts and to that of central Tibet than the first class of Tibetan words which have found their way into Bunan.* These latter point to a much earlier period of the language. In speaking Tibetan the Lahauli uses, *e. g.*, **č'ug-po** for "rich," if speaking Bunan he says **p'yug-po** without knowing that both are one and the same (Tibetan) word ཕྱུག་པོ་ *p'yug-po.*" Of further examples given by Jaeschke, the following are the most striking. In speaking Bunan the Lahauli says **kres** "hunger" (Tibetan བཀྲེས་ *bkres,* usually pronounced **ṭes**), and **log-čum** "to read" (Tibetan ཀློག་པ་ *klog-pa,* usually pronounced **lok-pa**), he is, however, unaware that these Bunani words are borrowed from Tibetan, and therefore when speaking Tibetan he uses ལྟོགས་གྲི་ *ltogs-gri* (pronounced **tog-ri**) for "hunger," and གསིལ་ཅེས་ *γsil-čes* (pronounced **sil-če**) for "to read." In speaking Bunan he says **gram-pa** "cheek" (Tibetan. འགྲམ་པ་ *ₒgram-pa*), **gyogs-pa** "quick" (Tibetan མགྱོགས་པ་ *mgyogs-pa*), **p'yag-p'ul-čum** "to adore" (Tibetan ཕྱག་ཕུལ་བ་ *p'yag-p'ul-ba*); in speaking Tibetan he says **dam-pa, gyok-pa, č'ak-p'ul-če**

Against all this mass of evidence tending to prove that Tibetan orthography was intended to represent the spoken word, we have really, as far as I know, only two arguments, firstly, some peculiarities in the transcription of Sanscrit words, and secondly, that the dialect especially of U-Tsang, has lost all traces of this original pronunciation. This fact is certainly very striking, and is probably almost, if not quite, without a parallel. Still, considering all that must be said on the other side, it would seem that we must really accept the present orthography as a fairly correct representation of Tibetan pronunciation of the 7th or 8th century A. D. Indeed the great variety of prefixes, etc., employed leads us to conclude further, that the orthography was carefully and accurately fitted on to the pronunciation, that in short we have a practically phonetical transcript of the language as spoken by *T'on-mi Sam-bho-ṭa* and his immediate successors.

This does not preclude the possibility that the powers of certain letters, more especially *d*, *b*, *g*, have undergone some changes. It seems not quite improbable that these three letters were originally pronounced *θ*, v, χ, and even then we have no explanation for the fact that the juxtaposition of *d* and *b*, (དབ་) has the effect of mutually neutralizing the letters, so that the letter འ་ *'a* is the result, *i e.*, a spiritus lenis [1]. It is, however, not possible now to trace these changes. Those interested in the matter will find hints in Jaeschke's essays. But Jaeschke himself did not venture to express any decided opinion on the materials he had to go upon, and it cannot be said that our knowledge of Tibetan has been materially increased since his time. A careful examination of the peculiarities of dialects spoken in secluded valleys of Nepal, Sikkim and Bhotan would no doubt produce more material. The dialects of Khams and of the nomads of the plateaus in northern Tibet have also not been explored.

In a mountainous country dialectical variations are as a rule numerous, and in Tibetan-speaking countries not only every valley, but even neighbouring villages in the same valley have slightly diverging pronunciations and expressions. These minutiæ are most important for a study of the development of the dialects and of the phonetics of the Tibetan language They are, however, only obtainable during the course of many years' residence in the country. When Tibet is to open to Europeans for free travelling and permanent residence, we may hope to gain much fuller information, and our present views may possibly require to be totally changed.

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[1] Jaeschke. Dictionary p xv This is not, however, always the case, for དབང་ *dban* "power" is usually pronounced **wań**, and in the Ladak dialect དབུལ་པོ་ *dbul-po* "poor" is pronounced **bul po,** certainly very rarely, but the word is not commonly used

A Note on the Buddhist Golden Book exhibited by the President, the Honourable Sir Charles Elliott, K. C. I. E. By Çarat Candra Dās, C. I. E.

(Read January, 1894.)

In February last the President exhibited a Manuscript called the Buddhist Golden Book containing the *Kamma-vācā* written on thick gilt lacquer leaves which he had brought from Cox's Bazār, Chittagong. On that occasion Dr Hoernle gave an account of its contents based on a Latin translation of the *Kamma-vācā*, published by Spiegel in 1841 As both the text and translation of the *Kamma-vācās* had been published by Dickson in 1881 and by Dr. Frankfurter in 1883, and lastly by Mr Herbert Baynes in the *Journal* of the Royal Asiatic Society, the Golden Book which possessed such an attractive and glittering appearance, seemed to be of little value In page 53, of the *Journal* of the Royal Asiatic Society for January 1892, Mr Herbert Baynes wrote as follows —

> "Having recently received from Mandalay through the kindness of an uncle, several interesting and important Buddhist MSS in Pali, Burmese and Shan, I venture to lay before the Society a collection of *Kamma-vācās*, some of which, though known to European scholars, have hitherto remained unedited The first Manuscript is a very handsome copy of the *Kamma-vācam* in Burmese ritual, or 'tamarind-seed' letters, printed with a thick black resinous gum on 16 leaves of royal discarded *pasohs*, each leaf containing 6 lines each side."

This announcement and the translations of the different editions of the text, including that made by Mr Clough in 1834, impressed me with the importance of the subject It seemed to me unlikely that a book which was held in unlimited veneration by the entire Buddhist clergy of Burma, Siam, and Ceylon could be an object only of passing notice to the literary world Shortly after the meeting, Sir Charles Elliott handed over to me the Manuscript for further examination of its contents. In obedience to his wish I have made minute inquiries regarding the contents of the *Kamma-vācās* and language, and the character used in the Manuscript I am glad to be able to say that the work when published with its commentary, will be of the highest value to all who inquire into the history of the art of writing and the study of religion, and particularly to the student of Buddhism.

No ancient work either in Sanskrit or Pāli written in the form of *Sūtra* (aphorisms) can be of any value when published without its commentary. As all the editions of the *Kamma-vācā* that have come to my notice are without their commentaries, it is no wonder that little importance should be attached to them. I have been informed that there are in a certain Buddhist library at Colombo, two commentaries on the *Kamma-vācās*, one of which is very elaborate and the other brief. If we obtain a copy of these two, it will be easy to edit the Manuscript before us. No work on Buddhism that has yet been issued by the Asiatic Society of Bengal, can have higher claims to literary and historical, as well as sacerdotal importance, than this book of the rules for admission into the holy order of the Buddhist monks, as prescribed by the founder of Buddhism himself. The *Kamma-vācā* is in fact the basis of Buddhist monkhood, and contains the entire history of the order from its foundation by the Buddha to its maturity during the course of his ministry, which extended over forty-five years.

This Manuscript is written in a missing form of the ancient *Pāli* character. It resembles what is called the square *Pāli*, but differs from the latter just as the Dēvanāgarī differs from the Bengali, or the Russian from the Roman character. The Burmese call it the 'tamarind-seed character' on account of the resemblance of the lines forming the letters to tamarind-seeds. Whether this was the earliest sacred character of the Buddhists of India, or the square *Pāli*, and in which of these the early *Pāli Gāthas* were written, are points which require careful examination. The *Pāli* books of Ceylon are written in Singhalese, those of Siam and Cambodia in Cambodian, and those of Burma in Burmese, with the exception of the *Kamma-vācās* which are invariably to be found in the so-called tamarind-seed character.

The *Kamma-vācās*, in the shape they are embodied in the Golden Book, are not to be found in any Buddhist country except Burma. The Burmese who obtained their religion directly from India got the golden book from Magadha—the central and the earliest seat of Buddhism. It is prized by the Burmese for its writing, though many among them can hardly read the character used in it. The learned priests of Burma believe that the writing of the golden book is, in fact, the last vestige of the ancient *Pāli* character in which the sacred books of the Buddhists were written in very early times. It is for these reasons that the golden book is more worshipped than read by the Burmese people. In Siam the priests read the *Kamma-vācās* from the Vinaya text and at the time of ritualistic service recite from memory in the manner of the Ceylonese Buddhists. The Siamese got Buddhism from Cambodia where it was introduced from Ceylon. Their sacred *Pāli* books are written in the Çambodian character which is a modification of the square *Pāli* The Golden Book is not to be found in Siam, Cambodia or Ceylon Dr. Frankfurter, the author of the *Pāli* grammar, has published a table of the various characters in which the sacred *Pāli* books are written In his list no mention is made or specimen given of the character of the Golden Book. Mr Herbert Baynes the latest writer on the *Kamma-vācā* has not given any description of the tamarind-seed character in which the Burmese manuscript on ritual is written In the subjoined plate (Plate I) I have arranged the three characters, *viz.*—the characters of the Açōka inscriptions, the ancient *Pāli* obtained from Sir Charles Elliott's manuscript, the Golden Book; and the square *Pāli* character as given by Dr. Frankfurter in his *Pāli* Grammar. Comparing the character of the Golden Book with the first and the last, I find it bears a closer resemblance to the Açōka character than to the square *Pāli* which has hitherto been considered to be the character in which the early Buddhist books were written. Moreover, the entire absence of the vowel long *ī*, either as a letter or a vowel sign in the Golden Book, shews that its characters belong to an earlier stage than the square *Pāli*, in which the long *ī* is a prominent feature The square *Pāli* is in fact an ornamental form derived from the ancient *Pāli* character of the Golden Book brought by Sir Charles Elliott. The long *ī* exists in the Burmese, Cambodian and Ceylonese characters which owe their origin to the square *Pāli*. There is one more peculiarity in the Golden Book which deserves notice. The letter which is absent in the Açōka character, is to be found in the Golden Book, from which circumstance I may conclude that the Açōka character was older than the character of the Golden Book

The name *Pāli*, according to the Southern Buddhists, has two significations, first, the sacred books and treatises which emanated from the Buddha and were delivered to the world by his disciples like the Christian Gospels. These were arranged in serial order and were called *Pāli*. In this sense the name *Pāli* signifies only the books or series of treatises, and not the language or character to which it is now ordinarily applied.

Secondly, the name *Pāli* signifies anything that is formed in rows, like the lines of birds flying in the air. This meaning is significant on account of its agreeing with the rows of letters as well as the lines of writing in a book. It is therefore probable, if we are to believe the account of the Buddhists, that the earliest name that was given to the second stage of the written character of India was *Pāli* According to them, the classical or ancient *Māgadhī*, known as the language of the *Pāli*, *i.e.*, of the sacred books, was the *Mūla Bhāsā* of India, in short the basis of Sanskrit. The ancient *Māgadhī* refined was Sanskrit, and the later *Māgadhī* corrupted became the Prākrit. Prākrit continued to be the language of Magadha till the time of the Pāla dynasty, when the revival of the study of Sanskrit in Bengal, first at Gauḍa and subsequently on the banks of the Bhāgīrathī, formed the Bengali language, which is indeed a mixture of Sanskrit and Prākrit I here annex a short introduction to the *Kamma-vācā* which I have compiled from the Vinaya Text published in the series of *Sacred Books of the East*, and from the Manuscript, which I have deciphered with the help of Mr. Dharmarāj Barua.

INTRODUCTION TO THE KAMMA-VĀCĀ [1]

The Origin of the Buddhist Church.

Çākya Muni dwelt at Uruvēlā, on the bank of the river Nairañjana (Phālgū) at the foot of the *Bōdhi* tree (tree of wisdom), just after he had become Buddha (gained supreme intelligence) Having sat uninterruptedly for seven days at the foot of the *Bōdhi* tree, he enjoyed the bliss of *nirvāna* (emancipation from misery and sorrows). Then he arose from that state of meditation and moved to the foot of the *Ajapāla* (banyan tree[2]) and enjoyed the bliss of emancipation for seven days From there he moved to the foot of a *Mucalinda* tree (Barringtonia Acutangula), where he meditated for seven days, enjoying the same bliss. He then moved to the foot of the tree called *Rajāyatana*. At this time two merchants, called Tapussa and Bhallika, came travelling on the road from Orissa to that place They took rice-cakes and lumps of honey, and went to the place where the Blessed One was. Having approached him, they reverentially addressed him "May the Blessed One accept from us these rice-cakes and lumps of honey!" The Buddha received the offerings in four stone bowls that lay near him and ate from them. As soon as he had finished eating, the two merchants bowed down in reverence at his feet, and thus addressed him "We take our refuge, Lord, in the Blessed One and in the *Dharma*, may the Blessed One receive us as his disciples"[3] Afterwards the Blessed One thought, "To whom shall I preach the doctrine first? Who will understand this doctrine easily? The five Bhikkhus (who were formerly my companions) have done many services to me. What if I were to preach the doctrine first to them where do they dwell now?" So thinking; he saw by the power of his divine, clear vision, that the five Bhikkhus were living at

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[1] Mahāvagga I, 1 & ff Ed

[2] *I e*, Banyan tree of the goatherds.

[3] It may be noted here that these two were the first lay disciples of the Buddha. Even then no *samgha* (priesthood) was formed.

Benares, in the deer-park, called Rṣipatana. He proceeded to Benares. Now Upaka, a man belonging to the *Ājīvaka* sect (*i e.*, the sect of naked ascetics) saw the Blessed One travelling on the road, between the Bōdhi tree (Bōdh Gayā[1]) and Gayā (city), and addressed him saying "Your countenance, friend, is serene, your complexion is pure and bright. In whose name, friend, have you retired from the world? Who is your teacher? Whose doctrine do you profess?" To this the Buddha replied "I have overcome all foes, I am all wise, I am free from stains in every way, I have left everything, and have obtained emancipation by the destruction of desire. Having myself gained knowledge, whom should I call my master? I have no teacher, no one is equal to me, in the world of men and of gods no being is like me. I am the Holy One in this world, I am the highest teacher. I alone am the absolute Sambuddha, I have gained coolness (by the extinction of all passions) and have obtained Nirvāna To found the Kingdom of Truth I go to the City of the Kāçī (Benares) I will beat the drum of the Immortal in the darkness of this world" Upaka replied "You profess then, friend, to be the Holy, Absolute Jina, the Victorious One" Buddha said "Like me are all Jina who have reached extinction of sensuality, individuality, delusion and ignorance. I have overcome all states of sinfulness, therefore, Upaka am I the Jina, the Victorious" When he had spoken thus, Upaka replied "It may be so, friend," shook his head, took another road and went away

And the Blessed One, wandering from place to place came to Benares, to the deer-park Rsipatana, to the place where the five Bhikkhus were When he gradually approached near them, they went forth to meet him, one took his bowl and his robe, another prepared a seat, a third one brought water for the washing of the feet, a foot-stool, and a towel Thus reverentially received, the Buddha addressed the five Bhikkhus —"There are two extremes, O Bhikkhus which he who has given up the world ought to avoid What are these two extremes? A life given to pleasures, devoted to pleasures and lusts, this is degrading, sensual, vulgar, ignoble and profitless and a life given to mortifications, this is painful, ignoble and profitless By avoiding these two extremes the Buddha has gained the knowledge of the Middle Path which leads to insight and to wisdom, which conduces to calm, to knowledge, to *Sambōdhi* (true enlightenment), and to *Nirvāna* This is the Middle Path, the Holy Eightfold Path, which consists of Right Belief, Right Aspiration, Right Speech, Right Conduct, Right Means of Livelihood, Right Endeavour, Right Memory, Right Meditation.

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[1] I may take this opportunity of pointing out that the correct spelling of this name is Bōdh Gayā, not Buddha Gayā Ed

"This is the Noble Truth of Suffering. Birth is suffering, decay is suffering; illness is suffering; death is suffering. Presence of objects we hate, is suffering, Separations from objects we love, is suffering; not to obtain what we desire, is suffering. Briefly, the fivefold clinging to existence is suffering"

"This is the Noble Truth of the Cause of Suffering Thirst, that leads to re-birth, accompanied by pleasure and lust, finding its delight here and there.

"This is the Noble Truth of Cessation of Suffering · it ceases with the complete cessation of this thirst—a cessation which consists in the absence of every passion,—with the abandoning of this thirst, with the doing away with it, with the destruction of desire.

"As long as I did not possess this true knowledge and insight into the four Noble Truths, so long I knew that I had not yet obtained the highest absolute *Saṁbōdhi* But since I possessed with perfect purity this true knowledge, then I knew that I had obtained the highest universal *Saṁbōdhi* in the world of men and gods The emancipation of my mind cannot be lost: this is my last birth hence I shall not be born again"

Origin of the Great Order of Bhikkhus [1]

The five Bhikkhus were delighted, and they rejoiced at the words of the Blessed One. And when this exposition was propounded, the Venerable Kaundinya obtained the pure and spotless Eye of the Truth ·— Whatsoever is subject to the condition of origination, is subject also to the condition of cessation. And the Blessed One pronounced this solemn utterance "Truly, Kaundinya has perceived it (*Aññāsi*)." Hence the Venerable Kauṇḍinya received the name of Aññātakōṇḍiñña (Ājñātakaundinya, Kaundinya who has perceived the doctrine) He then spoke to the Blessed One "Lord, let me receive from Thee the *Pravrajyā* and *Upasampadā* ordinations." "Come, O Bhikkhus," said the Blessed One, "well taught is the doctrine lead a holy life for the sake of the complete extinction of suffering" Thus the Venerable Kauṇḍinya received the *Upampadā* ordination.

Thus originated the custom of initiating one who has taken the *Pravrajyā* vow of renunciation into the Order of the Perfected, called *Upasampadā.* The Blessed One was the first to renounce the world and to become perfected in Supreme Knowledge, i e, *Upasampanna.*

Then the four remaining *Bhikkhus,* having mastered the Truth, spoke to the Blessed One, "Lord, let us receive the *Pravrajyā* and *Upasampadā* ordinations from the Blessed One." "Come, O Bhikkhus," said the Blessed One, "well taught is the doctrine. lead a holy life for the sake of the complete extinction of suffering." Thus these venerable persons became ordained into the "Order of the Perfected," which henceforth, with the Buddha at its head, became known as the "*Saṁgha*," the Holy Communion. And for the first time the Buddhist triad, *i e*, *Buddha*, *Dharma*, and *Saṁgha*, the Supreme Perfected Being, his doctrine and priesthood was formed. Before this there existed the two, *i. e.*, the Buddha and his doctrine (*Dharma*) There was no Buddhist priesthood till then.

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[1] Mahāvagga I, 6, 29 Ed

When the Blessed One had converted the five Bhikkhus into his doctrine, Yasa, the noble youth, the son of a rich merchant of Benares, being satiated with the pleasures of the world, happened to visit him in the grove of Rsipatana Shortly after Yasa's arrival, his father came in search of him The Blessed One convinced both the father and the son of the excellence of his doctrine And Yasa, the noble youth, soon after the Çrēsthin (merchant) was gone, said to the Buddha "Lord, let me receive the *Pravrajyā* and *Upasampadā* ordinations" Said the Buddha, "Well taught is the doctrine lead a holy life for the sake of the complete extinction of suffering" Yasa was accordingly admitted into the Holy Order of Bhikkhus. In the evening of that day Buddha visited the house of the Çrēṣṭhin, when Yasa's former wife and mother came, and reverentially saluting, sat down near him to hear the *Dharma*. The Blessed One talked about the merits obtained by alms-giving The ladies, having seen the Truth, said "We take our refuge, Lord, in Thee and in the *Dharma* and in the fraternity of Bhikkhus May the Blessed One receive us from this day forth, while our life lasts, as disciples who have taken their refuge in Him" These were the first females in the world who became lay disciples by the formula of taking refuge in the holy triad. Thereafter fifty-four lay persons, friends of the venerable Yasa, belonging to the highest families in the country, were admitted into the Holy Order, in consequence of which the number of *Arahats* then rose to sixty-one. At this stage the Blessed One said to the Bhikkhus—

Origin of the Buddhist Propaganda.[1]

"Go ye now, O Bhikkhus, and wander, for the gain of the many, for the welfare of the many, out of compassion for the world, for the good, for the gain, and for the welfare of the gods and men Let not two of you go the same way Preach the doctrine which is glorious in the beginning, glorious in the middle, glorious at the end, in the spirit and in the letter, proclaim a consummate, perfect and pure life of holiness There are beings whose mental eyes are covered by scarcely any dust; but if the doctrine is not preached to them, they cannot attain salvation.

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[1] Mahāvagga, I, 11, 1 Ed.

They will understand the doctrine And I will go, also, to Uruvēlā, to Sēnāninigama, in order to preach the doctrine ";

While charging them with this commission, the Buddha said: "I grant you, O Bhikkhus, this permission: Confer henceforth in the different regions, and in the different countries the *Pravrajyā* and *Upasampadā* ordinations yourself on those who desire to receive them And you ought to confer the *Pravrajyā* and *Upasampadā* ordinations in this way —Let him who desires to receive the ordination, first have his hair and beard cut off, let him put on yellow robes, adjust his upper robe so as to cover one shoulder, salute the feet of the Bhikkhus with his head, and sit down squatting, then let him raise his joined hands, and tell him to say 'I take my refuge in the Buddha; I take my refuge in the *Dharma*; I take my refuge in the *Saṁgha.*' In three times repeating this declaration of taking refuge in the holy triad consist the *Pravrajyā* and *Upasampadā* ordinations."

Thereafter the Buddha leaving Benares proceeded to Uruvēlā. Here while residing in a certain grove, he admitted thirty young men into the order of Bhikkhus. He then went to the hermitage of the three leaders of the *Jaṭila* sect of *Sannyāsīs* who wore matted hair, and converted them, with their followers, about 1,000 in number, to his doctrine, and admitted them into the Holy Order From Uruvēlā the Buddha proceeded to Rājagṛha, the capital of Magadha, and there took his residence in *Laṭṭhivana* The conversion of Uruvēlā Kaçyapa, the most famous leader of the *Jaṭila* ascetics spread the fame of the Buddha and his doctrine far and wide. Being informed of this marvellous success, Bimbisāra, the King of Magadha, with twelve myriads of Magadha Brāhmans and householders went to the place where the Blessed One was They thought within themselves "How now is this? Has the great Çramana (the Buddha) placed himself under the spiritual direction of Uruvēlā Kaçyapa, or has Uruvēlā Kaçyapa placed himself under the great Çramaṇa?"

Hearing from the lips of Uruvēlā Kaçyapa the real story of his conversion, King Bimbisāra with ten thousand men imbibed faith in the doctrine of the Buddha and became his lay disciples The King now reverently offered the Buddha his pleasure-grove called Vēṇuvana for his residence The Blessed One accepted the grove (Ārāma) and took his residence there Here he admitted into the Holy Order two friends, named Kōlita and Upatiṣya. This auspicious pair of his disciples, who also bore respectively the names of Maudgalyāyana and Çāriputra played an important part throughout the whole course of the Buddha's ministry Soon after their conversion two hundred and fifty disciples of Samjaya, the Brāhman *Parivrājaka*, entered the holy order. Thereafter many distinguished young Magadha noblemen led a religious life under the direction of the Buddha. At this people were annoyed, murmured, and became angry, saying, "The Çramaṇa Gautama causes fathers to beget no sons, wives to become widows, and families to be extinct. Now he has ordained one thousand *Jaṭila Ṣannyāsis* (ascetics), and he has ordained these two hundred and fifty *Parivrājaka* (wandering ascetics) who were the followers of Saṁjaya." And, moreover, when they saw the Bhikkhus, they reviled them.

The reason was evident The Bhikkhus went on their rounds for alms, wearing their under and upper garments improperly. While people were eating, they held out their alms-bowl in which were held leavings of food. They asked for soup and boiled rice themselves and ate it; in the dining hall they made a great and loud noise The Buddha now perceived that the order of Bhikkhus had already grown too large, and that discipline was necessary for its regulation. He addressed the Bhikkhus, saying —"I prescribe, O Bhikkhus, that young Bhikkhus choose a preceptor (*Upādhyāya*) The *Upādhyāya* ought to consider the pupil as a son, and the pupil ought to consider the *Upādhyāya* as a father Thus these two, with united confidence and communion of life, will progress, advance, and reach a high stage in this doctrine and discipline"

The origin of the Kamma-vācās [1]

At that time a certain Brāhmaṇa came to the Bhikkhus and asked them for the *pravrajyā* ordination The Bhikkhus were not willing to ordain him He became lean and emaciated from disappointment and the Blessed One saw him, and said:—"Now, O Bhikkhus, who remembers anything about this Brāhmana?" The Venerable Çāriputra said to the Blessed One "This Brāhmana, Lord, one day, when I went through Rājagṛha for alms, ordered a spoonful of food to be given to me, this is what I remember of him, Lord." The Buddha said, "Good, good, Çāriputtra, therefore confer you the *pravrajyā* and *upasaṁpadā* ordinations on that Brāhmana"

"Lord, how shall I confer the *pravrajyā* and *upasampadā* ordinations on this Brāhmaṇa?" The Blessed One said, "I abolish from this day the *upasampadā* ordination by the threefold declaration of taking refuge, which I had formerly prescribed I now prescribe that you confer the *upasampadā* ordination by a formal act of the Order in which the announcement is followed by three questions[2]:—Let a learned, competent *Bhikkhu* proclaim the following *jñapti* (announcement) before the *Saṁgha* (Chapter).

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[1] Mahāvagga, I, 28, Ed.

[2] The forms for bringing a formal motion before the Order is the following · The mover first announces to the assembled Bhikkhus what resolution he is going to propose, this announcement is called *Jñapti*. After the *Jñapti* follows the question put to the Bhikkhus present, if they approve the resolution. This question is put three times

'Let the *Saṁgha*, Reverend Sirs, hear me. This person *N N.*, desires to receive the *upasaṁpadā* ordination from the Venerable *N. N.*, as his *Upādhyāya*, (preceptor). If the *Saṁgha* is ready, let the *Saṁgha* confer on *N. N.*, the *upasaṁpadā* ordination. Let any one of the venerable brethren who is in favour of the ordination of N. N., be silent, and any one who is not in favour of it, speak' This announcement should be recited thrice Then let him say —

'*N. N.*, has received the *Upasaṁpadā* ordination from the *Saṁgha* with *N. N.* as *Upadhyāya* The *Saṁgha* is in favour of it, therefore it is silent. Thus I understand.'"

KAMMA-VĀCĀ.

PAṬHAMAPARICCHĒDŌ.

UPASAMPADĀ-KAMMAVĀCĀ.

NAMŌ TASSA BHAGAVATŌ ARAHATŌ SAMMĀSAṀBUDDHASSA.[1]

Paṭhamaṁ upajjhaṁ gāhāpētabbō. Upajjham gāhāpētvā pattacīvaram ācikkhitabbaṁ.

'Ayam tē pattō?' 'Āma bhantē'

'Ayaṁ samghāṭi?' 'Āma bhantē.'

'Ayam uttarāsamgō?' 'Āma bhantē.'

'Ayam antaravāsakō?' 'Āma bhantē.'

'Gaccha amumhi, ōkāsē tiṭṭhāhi.'

'Suṇātu mē bhantē samghō *Nāgō* āyasmatō *Tissassa* upasampadāpēkkhō Yadi samghassa pattakallaṃ, aham *Nāgaṁ* anusāsēyyam

'Suṇāsi *Nāga*, ayam tē saccakālō bhūtakālō Yam jātaṁ, tam samghamajjhē puccham tē Santaṃ atthīti vattabbam Asantam natthīti vattabbam Mā khō vitthāsi Mā khō akusalōsi

'Ēvam tam pucchissanti

'Santi tē ēvaṁrūpā ābādhā?'

'Kuṭṭham?' 'Natthi bhantē'

'Gaṇḍō?' 'Natthi bhantē'

'Kilāsō?' 'Natthi bhantē.'

'Sōsō?' 'Natthi bhantē.'

'Apamārō?' 'Natthi bhantē.'

'Manussōsi?' 'Āma bhantē'

'Purisōsī?' 'Āma bhantē.'

'Bhujissōsi?' 'Āma bhantē.'

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[1] Cf. Mahāvagga, I, 76, 1. Ed.

'Aṇanōsi?' 'Ama bhantē.'
'Nasi rājabhaṭō?' 'Āma bhantē'
'Anuññātōsi mātāpitūhi?' 'Āma bhantē'
'Paripuṇṇa-vīsati-vassōsi?' 'Āma bhantē'
'Paripuṇṇaṁ tē patta-cīvaraṁ?' 'Ama bhantē'
'Kimnāmōsi?' 'Ahaṁ bhantē *Nāgō* nāma'
'Kō nāma tē upajjhāyō?' 'Upajjhāyō mē bhantē āyasmā *Tissatthērō* nāma'
'Sunātu mē bhantē saṁghō, *Nāgō* āyasmatō *Tissassa* upasampadāpēkkhō. Anusiṭṭhō sō mayā'
'Yadi saṁghassa pattakallam, *Nāgō* āgacchēyya.'

Kamma-vācā (Formal acts of Buddhist ritual).

CHAPTER I.

Ritual for the Ordination of Monks.

Reverence to the Blessed One, the Holy One, the Fully Enlightened One.

First (the candidate) should be made to have an *Upādhyāya* (Spiritual tutor)

Having been made to accept an *Upādhyāya*,[1] he should be asked, if he has got his alms-bowl and (religious) robes[2].

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[1] At that time the Bhikkhus conferred the *Upasampadā* ordination on a person that had no *Upādhyāya* They told this thing to the Blessed One who said 'Let no one, O Bhikkhus, who has no *Upādhyāya* receive the *Upasampadā* ordination, (*Mahāvagga*, I, 69)

[2] The Buddha prescribed the stuff of which the religious robes of the Buddhist monks should consist, while speaking of the four Resources of a *Bhikkhu* 'The religious order has the robe made of rags taken from a dust-heap or from a cemetery for its resource. Linen, cotton, silk, woollen garments, coarse cloth, hempen cloth, are extra allowances' As to the manner of sewing in patches, the instruction contained in the following discourse will be interesting

"Now, on one occasion the Buddha set forth on his journey towards *Dakkhinagiri* (the Southern hills of Bihār) On the way he beheld how the Magadha rice-fields were divided into short pieces, and in rows, and by outside boundaries or ridges, and by cross boundaries. On seeing this Buddha thus spoke to the Venerable Ānanda. 'Dost thou perceive, how the rice-fields are divided into short pieces, and in rows?'

'Even so, Lord'

'Could you, Ānanda, provide robes of a like kind for the Bhikkhus?'

'I could, Lord.'

"Then Ānanda provided robes of a like kind for many Bhikkhus, and addressing the Buddha said, 'May the Blessed One be pleased to look at the robes which I have provided.' Buddha was pleased with what he saw, and addressing the Bhikkhus said

'Is this your alms-bowl'? 'Yes, Venerable Sir.'

'Is this your *Samghāṭī* (wrapper for the body)? 'Yes, Venerable Sir.'?

'Is this your *Uttarāsaṅga* (upper robe)'? 'Yes, Venerable Sir.'

'Is this your *Antaravāsaka* (under robe)'? 'Yes, Venerable Sir.'

'Go to that place and wait (standing).'

'Let the *Saṁgha* (Chapter), Reverend Sirs, hear me. This person, Nāga, desires to receive the *Upasampadā* ordination with the Venerable Tiṣya as his *Upādhyāya*. If the *Saṁgha* is ready, let me instruct Nāga accordingly. Do you hear, Nāga? This is the time for you to speak the truth, and to say that which has been. When I ask you before the Assembly about that which is, you ought, if it is so, to answer "It is," if it is not so, you ought to answer: "It is not." Be not disconcerted, be not perplexed. I shall ask you thus (in the presence of the *Saṁgha*) 'Are you afflicted with the following diseases—[1] leprosy, boils, dry leprosy, consumption, and fits?' 'No, Venerable Sir.'

'Are you a man[2]'? 'Yes, Venerable Sir.'

'O Bhikkhus, Ānanda is an able man, he can make the cross seams, and the intermediate cross seams, and the greater circles, and the lesser circles, and the turning in, and the lining of the turning in, and the collar-piece, and the knee piece, and the elbow-piece. And it shall be of torn pieces, roughly sewn together suitable for a *Çramana* (monk), a thing which his enemies cannot court. I enjoin upon you O Bhikkhus, the use of an under robe of torn pieces, and of an upper robe of torn pieces, and of a waist cloth of torn pieces.'"

[1] At that time the five diseases—Leprosy, boils, dry leprosy, consumption and fits prevailed among the people of Magadha. The people who were affected with them went to the physicians Jīvaka and said, 'Pray, doctor, cure us.' 'I have too many duties, Sir, and am too occupied. I have to treat the Magadha King Bimbisāra, and the royal seraglio, and the fraternity of Bhikkhus, with the Buddha at their head. I cannot cure you.' Now these people thought, 'Indeed, the precepts which these monks keep and the life they live are commodious, they have good meals and lie down on beds protected from the wind. What if we were to embrace the religious life among them, then the Bhikkhus will nurse us and Jīvaka will cure us.' Thus these persons went to the Bhikkhus who conferred on them the *Pravrajyā* (Buddhist) ordination. Some of them becoming free from the sickness returned to the world leaving off their monkish life. Now Jīvaka saw them and said 'Had you not embraced the religious, life, Sirs, among the Bhikkhus?' 'Yes, doctor.' 'And why have you adopted such a course, Sirs?' Then they told him the whole matter. And Jīvaka went to the place where the Blessed One was, and representing to him all about the sick men, said 'Pray, Lord, let their Reverences not confer the *Pravrajyā* ordination on persons afflicted with the five diseases.' In consequence of that the Blessed One addressed the Bhikkhus 'Let no one, O Bhikkhus, who is affected with the five diseases, receive the *Pravrajyā* ordination.'

[2] At that time there was a serpent who was ashamed of and conceived aversion for his having been born as a serpent. Now this serpent thought, 'What am I to

'Are you a male[1]?' 'Yes, Venerable Sir.'
'Are you a free man[2]?' 'Yes, Venerable Sir.'
'Have you no debts[3]?' 'I have no debts, Venerable Sir.'

. . .

do in order to become released from being a serpent, and quickly to obtain human nature?' Then this serpent gave himself the following answer: 'These monks of Çākya lead indeed a virtuous, tranquil, holy life; they speak the truth; they keep the precepts of morality, and are endowed with all virtues. If I could obtain the *Pravrajyā* ordination with them, I should be released from being a serpent and quickly obtain human nature' Then that serpent, in the shape of a youth, went to the Bhikkhus, and asked them for the *Pravrajyā* ordination; the Bhikkhus conferred on him the ordination At that time that serpent dwelt together with a certain Bhikkhu in the Jētavana *Vihāra* near its boundary wall When his companion had gone out of the *Vihāra* for a walk at dawn, the serpent, who thought himself safe from discovery, fell asleep in his natural shape The whole *Vihāra* was filled with the snake's body, his winding jutted out of the window When the Bhikkhu returned to the *Vihāra* he saw the snake's body, and became terrified, and cried out The Bhikkhus ran up to him and made a noise when they saw the snake's body The serpent awoke from that noise and sat down on his seat The Bhikkhus said to him 'Who are you' 'I am a serpent, Reverend Sirs' 'And why have you done such a thing'? Then the serpent told the whole matter to the Bhikkhus The Bhikkhus told it to the Blessed One.

In consequence of that, and on this occasion, the Blessed One, having ordered the fraternity of Bhikkhus to assemble, said to that serpent 'You serpents are not capable of spiritual growth in this doctrine and discipline However, serpent, go and observe fasts on the fourteenth, fifteenth, and eighth day of each half-month in the name of the Trinity Thus will you be released from being a serpent and quickly obtain human nature' Then the Blessed One said to the Bhikkhus 'There are two occasions on which a serpent who has resumed human shape manifests his true nature When he has sexual intercourse with a female of his species, and when he thinks himself safe from discovery and falls sleep'

[1] At that time a certain hermaphrodite had received *Pravrajyā* with the Bhikkhus The hermaphrodite being possessed of the nature of both the sexes committed sexual intercourse with the Bhikkhus and the Bhikkhunī's.

They told this thing to the Blessed One. 'Let not a hermaphrodite, O Bhikkhus, receive the ordination'

[2] At that time a slave ran away, and was ordained with the Bhikkhus When his masters saw him, they said 'There is our slave, come let us lead him away, back to our house' They told this thing to the Blessed one. 'Let no slave, O Bhikkhus, receive the *Pravrajyā* ordination'

[3] At that time a certain person who was in debt, ran away, and was ordained with the Bhikkhus When his creditors saw him, they said, 'There is our debtor, come let us lead him to prison?' But some people replied 'Do not say so, Sirs A decree has been issued by the Magadha King. No one is to do harm to those who are ordained as the monks of Çākya' 'How can they ordain a debtor?' They told this to the Blessed One. 'Let no debtor, O Bhikkhus, receive the *Pravrajyā* ordination'

'Are you not in the royal service[1]'? 'I am not, Venerable Sir'

'Have your father and mother[2] given their consent to your entering the *Pravrajyā*'? 'Yes, Venerable Sir.'

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[1] At that time the border provinces of the kingdom of Magadha were agitated Then the Magadha king, Bimbisāra, gave order to the officers who were at the head of the army 'Well now, go and search through the border provinces' The officers bore his command saying 'Yes, your Majesty'

Many warriors among them thought, 'We who go to war and find our delight in fighting, do evil and produce great demerit. What shall we do that we may desist from evil doing and may do good?'

Then they thought, 'The monks of Çākya lead indeed a virtuous, tranquil, holy life, they speak the truth, they keep the precepts of morality, and are endowed with all virtues' Thus these warriors went to the Bhikkhus and asked them for the *Pravrajyā* ordination, and were admitted into the Order

The officers at the head of the army asked the royal soldiers, 'Why, how is it that the warrior N N and N N are nowhere to be seen?' 'The warrior's N N and N N, Lords, have embraced religious life among Bhikkhus' The officers told this thing to the King, who asked the Officers of Justice; 'Tell me, my good Sirs, what punishment does he deserve who ordains a person in the royal service?'

'The *Upādhyāya*, Your Majesty, should be beheaded, to him who recites the *Kamma-vācās*, the tongue should be torn out, to those who form the Chapter, half of their ribs should be broken' Then the Magadha King went to the palace where the Blessed One was, and addressing him said 'Lord, there are unbelieving Kings who are disinclined to the faith, these might harass the Bhikkhus even on trifling occasions Pray, Lord, let their Reverences not confer the *Pravrajyā* ordination on persons in royal service'

Then the Blessed One thus addressed the Bhikkhus 'Let no one, O Bhikkhus, who is in the royal service, receive the *Pravrajyā* ordination He who confers it on such a person is guilty of *Duṣkrta*, offence'

[2] Then the Blessed One, went forth to Kapilavāstu and dwelt in the Çākya country, in the Banyan grove And in the fore-noon having put on his under-robes, took his alms-bowl, and with his robes on went to the residence of his father Having gone there, he sat down on a seat laid out for him Then the Princess, (Buddha's former wife) said to young Rāhula, her son, 'This is your father, Rāhula, go and ask him for your inheritance' Then young Rāhula went to the place where the Blessed One was, having approached him he said—'Father, your shadow is a place of bliss' Then the Blessed One rose from his seat and went away, and young Rāhula followed the Blessed One from behind and said 'Give me my inheritance, father, give me my inheritance father'

Then the Blessed One said to the Venerable Çāriputra 'Well Çāriputra, confer the *Pravrajyā* ordination on young Rāhula' The Venerable Çāriputra conferred the *Pravrajyā* ordination on young Rāhula Then the Çākya Çuddhōdana (Buddha's father) went to the place where the Blessed One was, having approached him and having respectfully saluted him, said, 'Lord I ask one boon of thee' The Buddha replied, the perfect ones are above granting boons before they know what they are

Çuddhōdana said 'Lord, it is a proper and unobjectionable demand.' 'Speak'

'When the Blessed One gave up the world, it was a great pain to me, so it was

'Are you full twenty years[1] old'? 'Yes, Venerable Sir.'

'Are your alms-bowl and your robes[2] in due state?' 'Yes, Venerable Sir.'

'What is your name'? 'My name is Nāga, Venerable Sir.'

'What is your (spiritual) teacher's name?' 'The name of my tutor is Tiṣya, Venerable Sir'

'Let the *Saṁgha* (Chapter), Reverend Sirs, hear me This person, Nāga, desires to receive the *Upaṣampadā* (ordination) from the Venerable Tiṣya (as his *Upādhyāya*).

'If the *Saṁgha* is ready, let Nāga come here (in the presence of the *Saṃgha*).'

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when Nanda did the same· my pain was excessive when my grandson Rāhula too, did so. The love for a son cuts the heart Pray, let their reverences not confer the *Pravrajyā* ordination on a son without his father's and mother's permission' The Blessed One then said to the Chapter. 'Let no son, O Bhikkhus, receive the *Pravrajyā* ordination without his father's and mother's permission'

[1] There was at Rājagṛha a company of seventeen boys, friends of each other. Thinking that they could live a life of ease and without pain, they went to the Bhikkhus and asked them for the *Pravrajyā* ordination The Bhikkhus admitted them into the holy order.

In the night, at dawn, these boys rose and began to cry, 'Give us rice, and milk. Give us soft food, give us hard food!' The Bhikkhus said, 'Wait, friends, till day time If there is rice and milk you will drink, if there is food, soft and hard, you shall eat' When they were thus spoken to the young Bhikkhus threw their bedding about and made it wet, calling out, 'Give us rice, milk, and food, &c'

Then the Blessed One, having arisen in the night, heard the noise which those boys made, and said to Ānanda 'Now, what noise of boys is that?' The Venerable Ānanda told the thing to the Blessed One 'It is true, that the Bhikkhus knowingly confer the *Upasampadā* ordination on persons under twenty years of age'

Then the Blessed One rebuked those Bhikkhus, and said, 'Let no one, O Bhikkhus, knowingly confer the *Upasampadā* ordination on a person under twenty years of age'

[2] At that time the Bhikkhus conferred *Upasampadā* ordination on persons that had no alms-bowl, or they went out for robes and alms naked, and received alms with their hands People were annoyed, murmured, and became angry, saying that they behaved shamelessly like the *Tīrthika Sannyāsīs* The Bhikkhus told this thing to the Blessed One 'Let no one, O Bhikkhus, receive the *Upasampadā* ordination without having an alms-bowl or the proper robes'

On a Stone Image of the Buddha found at Rājagṛha.—By G. A. GRIERSON, C. I. E., I. C. S.

(With Plate II.)

[Read, April, 1894.]

The image, of which a photograph accompanies this paper, was dug up by me some five years ago on the summit of Çaila-giri, a mountain about five miles to the S.-E. of the modern town of Rāj'gir. The mountain is one of those which surround the old valley of Rājagṛha, and is undoubtedly the same as the Gṛdhra-kūṭa of the Chinese pilgrims. It has been visited by Mr. Broadley and by Mr. Beglar (*vide* Rep. Arch. Surv. Ind., Vol. VIII), but has never been thoroughly investigated. The site would well repay judicious excavation. Owing to the thorny jungle with which the hill is covered, and the steepness of the ascent, a visit to the spot is no easy climb.

FA HIAN thus describes it [1]—"Entering the valley and striking the mountains to the south-east, ascending 15 *li*, we arrive at the hill called Gṛdhra-kūṭa. Three *li* from the top is a stone cavern facing the south. Buddha used in this place to sit in meditation. Thirty paces to the north-west is another stone cell in which Ānanda practised meditation.[2] The Dēva Māra Piçuna, having assumed the form of a vulture, took his place before the cavern and terrified Ānanda. Buddha by his spiritual power pierced the rock, and with his outstretched hand patted Ānanda's shoulder. On this his fear was allayed, the traces of the bird and of the hand-hole are still quite plain. On this account the hill is called 'The Hill of the Vulture-Cave.' * * * * Here, also, when Buddha was walking to and fro from east to west, in front of his cell, Dēvadatta, from between the northern eminences of the mountain, rolled down athwart his path a stone which wounded Buddha's toe; the stone is still there. The hall in which Buddha preached has been destroyed, but the foundations of the brick walls still exist."

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[1] Beal's translation, xxix.

[2] Both those caves still exist, and can be readily identified by a cleft in the rock which unites them.

HIUEN TSIANG[1] gives further particulars —"When Tathāgata had guided the world for some fifty years, he dwelt much on this mountain, and delivered the excellent law in its developed form King Bimbisāra, for the purpose of hearing the law, raised a number of men to accompany him from the foot of the mountain to its summit. They levelled the valleys and spanned precipices, and with stones made a staircase about ten paces wide and five or six *li* long In the middle of the road are two small *stūpas*, one called the 'Dismounting from the Chariot,' because the king, when he got here, went forward on foot; the other is called 'Sending back the crowd,' because the King, separating the common folk, would not allow them to proceed with him. The summit of the mountain is long from east to west, and narrow from north to south." The pilgrim then describes the caves mentioned by Fa Hian, and from his account, the ruined brick *Vihāra* must have been re-built after Fa Hian's departure.

There are other details given which I need not quote. Suffice it to say that the spot was one of considerable sanctity, and it was here that the Buddha dwelt during much of the later portion of his life, and is said to have delivered many of his most developed *sūtras* Though there has never been any serious doubt as to the identity of the spot, and though it had been twice visited by enthusiastic archæologists, it is curious that till I visited it, no attempt seems to have been made to exploit its treasures I had only a few hours available, but a very little examination showed the remains of important buildings, and gave me the beautiful image of the Buddha, shown in Plate II It is of a black stone, which stone-carvers of the neighbourhood told me came from Monghyr, and is in a state of excellent preservation, though there is no doubt as to its having lain for centuries safely buried in the ground.

The descriptions of the Chinese pilgrims are, as usual, accurate There are, as I have said, two large caves, joined together by a cleft in the rock, besides a number of smaller ones. The massive staircase of king Bimbisāra, with the ruins of its two *stūpas*, is still in existence, and I used it myself in clambering up to the site of the cave. The top of the mountain is simply a mass of buried ruins, and may contain unnumbered treasures

As regards the sculptured image itself,—for an excellent heliograph of which I have to thank Col Waterhouse,—Babu Çarat Candra Dās, C.I E., has been good enough to give me the following note, which he has drawn up with the assistance of Lama Çorab Gya-tsho —"The image belongs to the Mahāyāna school of Buddhism The Buddha is represented in the *dhyāni āsana*, or attitude of meditation, seated on a lotus The lotus, which grows in mud, is symbolical of purity born of a vile origin, and intimates that the Buddha was not tainted by the mire of worldly existence, of suffering, and of sin, though he was spiritually evolved out of the world This *Padmāsana* is placed on a *Vajra*,—the essence of the thunderbolt,—the diamond, which is symbolical of unchangeableness Hence the whole throne is called a *Vajrāsana*. This *Vajrāsana* is again placed on the back of two lions, to denote that the Buddha is supremely fearless[1] Beside each lion there is an *upāsaka*, or Buddhist devotee, and the whole is surmounted by the *Kalpavṛkṣa*, or Wishing-tree of Heaven.

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[1] Beal's translation, ii, 158.

" The image belonging to the Mahāyāna school, the Buddha is not accompanied by the Arhats, Çāriputra and Maudgalyāyana, but by the Bōdhisattvas Avalōkitēçvara, and Vajrapānī Avalōkitēçvara stands on the right in the *mahāmudrā* posture of meditation The particular *mudrā* is determined by the position of the fingers of his right hand He wears a tapering crown, such as those used by kings of early India during the Greek period The crown indicates that he is in this world looking both to the temporal as well as to the spiritual interests of all living creatures. A lotus flower touches his left arm on which he is slightly reclining This lotus is symbolical of his pure birth, like Padmayōni, *i e*, Brahmā He wears ornaments to show his royal birth.

" On the left of the Buddha stands Vajrapāni, the Bōdhisattva of mystical theology, and therefore called Guhyapati, the Lord of Mysticism In appearance he is exactly like Avalōkitēçvara These two Bōdhisattvas are called the *Upaputras* of the Buddha to them he delivered, respectively, the Mahāyāna Sūtras, and the Tantras.

" A little above their heads are two Caityas, called the Stūpas of accumulated flowers The representation of a Caitya, or monument containing relics of the Buddha, was considered as equally effective as making an image of his person. Images were difficult to make without unintentional irreverence in the result, and hence it was ordained that Caityas might be used to serve their purpose

" Above the Caityas are the images of two holy goddesses, Tārā the Fair and Tārā the Green[2]

" The White Tārā (*Liberatrix*) represents pure transcendental wisdom, which secures *nirvāna* to its possessor. She is the mother of all Buddhas and Bōdhisattvas, because, without Prajñā Pāramitā no one can become Buddha She (Tārā) liberates all *sattvas* from the worldly bondage She is white, a colour which is symbolical of perfect purity. She is gained by the practice of the *Sūtra*, the *Vinaya* and the *Abhidharma*.

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[1] Perhaps also with a reference to his race He was Çākya Simha—*G A G*

[2] See Dr Waddell's account of Tārā in J R A S for 1894, pp 51 & ff G A G

"Tārā the Green, represents the Çakti, or Prakṛti, the green nature symbolising the divine energy, or *Diva Natura*. Figuratively, she is married to Vajrapāni Bōdhisattva, the symbolical *puruṣa*. It is therefore held in the Mantrayāna (Tāntrik) section of Mahāyāna Buddhism, that when a man has studied or perceived the true secrets of nature, *i e.*, the all-pervading law of procreation, being duly initiated into the mystical doctrine taught by Vajrapāni, under miraculous inspiration of the Buddha, while in the *sambhōgakāya*, he will become one with a holy woman or goddess, and in that union vanish for ever from worldly existence, and enter into *Nirvāna*"

The inscription at the foot of the image is the ordinary Buddhist creed

On a new Copper-plate Grant of Dharmapāla.—By Umes Chandra Batavyal, I C S*

(With Plate III.)

[Read, April, 1894]

The copper-plate inscription, recording a grant of four villages by king Dharma Pāla to Bhaṭṭa Nārāyana, of which a transcript and an English translation are annexed, was discovered by me in the month of November, 1893, at Khālimpur, near Gaur, in the District of Malda. An illiterate Muhammadan cultivator found it in a paddy field, at the northern extremity of the village, while employed in ploughing it, about two years ago He is since dead. The Plate was with his widow, Mōrī Bēwā I have purchased it from her

The importance of this copper-plate to all students of Indian History, and particularly to Brāhmans and Kāyasthas in Bengal, who trace their descent from the five Brāhmans and the five Kāyasthas of Kannauj invited to this country by king Ādiçūra, cannot be over-estimated, while to those among the Bengal Brāhmans, who claim their descent from Bhaṭṭa Nārāyana himself, the interest attaching to the record is that of a piece of family history.

It is, so far as I know, the oldest copper-plate grant of the Pāla dynasty yet discovered Unfortunately it only gives the date of the grant, "In the year of the king's reign," and leaves the date of the reign itself in uncertainty. The latter is yet more or less conjectural

General Cunningham assigned to Gōpāla, father of Dharma Pāla, the latter part of the 8th century of the Christian Era*, while Dr. Rājendra Lāla Mitra placed him nearly a century later I think the former estimate to be the more correct The Lāhiris, among the Bārēndra Brāhmans, who claim their descent from Bhaṭṭa Nārāyana, have preserved a genealogical record which shows that Pītāmbar Lāhiri, the contemporary of Ballāla Sēna, was 14th in descent from Bhaṭṭa Nārāyana. Taking Pītāmbar as alive in 1150 A. D , and giving 25 years to each generation, we obtain 800 A D, as the date of Bhaṭṭa Nārāyaṇa. This closely agrees with Cunningham's conclusions deduced from other sources of information

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* [Owing to the importance of the copper-plate grant it has been thought advisable to publish Mr Batavyal's paper as it stands, without delay Ed]

The date of the copper-plate record, may, therefore, be roughly put down, in the present state of our knowledge, as 800 A.D It is thus nearly 1100 years old.

In external appearance it closely resembles the Plate of Nārāyana Pāla, described on page 217, Volume II, of Rājēndra Lāla Mitra's "*Indo-Aryans,*" though it is older than the latter.[1]

The Plate is about ¼th of an inch thick, and is oblong in shape, and has 33 lines of inscription in front, and 29 lines on the reverse. The whole has been deciphered by myself In one or two places the reading is a tentative one—subject to revision but upon the whole it may be taken as a correct re-production The letters mark the stage of the transition of the Dēvanāgarī into the Bangālī Some of the strokes are obsolete at the present day

The current traditions about Bhaṭṭa Nārāyana were a puzzle to the historical student in more respects than one According to some writers, Bhaṭṭa Nārāyaṇa was invited to Bengal by king Ādiçūra but according to the older genealogists—as for instance the famous *Dēvīvara,* the contemporary of *Caitanya,*—the name of the Brāhman of the Çāndilya *gōtra,* who came at the invitation of Ādiçūra, was Ksitīça Then, again, while some writers state that Bhaṭṭa Nārāyana was a contemporary of Ādiçūra, and place Ādiçūra in the end of the 10th century of the Çāka Era, another tradition makes Ādigāī Ōjhā,* son of Bhaṭṭa Nārāyana, a contemporary of king Dharma Pāla, who, as we have seen, lived at the end of the 8th century of the Christian Era. This last tradition[2] says that king Dharma Pāla made the grant of the village Dhāmasāra on the bank of the Ganges to Ādıgāī Ōȷhā, son of Bhaṭṭa Nārāyaṇa, and this specific statement has an appearance of authenticity about it. Its authenticity, however, is now confirmed by the copper-plate, at least incidentally, for we now know beyond doubt that Bhaṭṭa Nārāyana was a contemporary of Dharma Pāla, and his son Ādıgāī Ōȷhā, too, appears to have been patronized by that king

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[1] It measures 1′ 4⅜″ × 11⅜″ inches, and has a scalloped top of brass 7 inches high, and 4 inches long at the base, bearing what seems to be an impression of the royal seal The centre of the top is enclosed in a ring of 4 circles, the innermost of which is 2½ inches, and the outermost 4 inches in diameter Around these circles are six projections representing, probably, lotus petals, the two uppermost of which enclose what seems to be the effigy of a human head The emblem in the centre is a wheel mounted on a stand, and supported by a deer rampant on each side

Below this is written between two parallel lines *Çrīmān Dharmapāla Dēvah,* and below this writing is a sprig formed of a flower and two leaves

[2] It has been preserved in the genealogical record of the Lāhiris, to which allusion has been made above It runs as follows —

गुम्फोत्फुल्लास्य पद्मे स्फुरति सचकितं वेदवेदाङ्गवाणी
मानी कोदण्डपाणिः पवनगतिहयः कौशिकोऽप्यौघ मौलिः।

Up to date no authentic account of Ādıçūra has been obtained. The oldest writers on brāhmanical genealogy, whose writings have come down to us—I refer particularly to Harı Mıçra and Ēru Mıçra—place Ādıçūra shortly before the Pālas; and they state that shortly after the arrival of the five Brāhmanas from Kannauȷ, the kingdom of Gauṛ became subject to the Pálas. These writers expressly mention Dēva Pāla, the successor of Dharma Pāla, as the most famous king of the Pāla dynasty, which succeeded the dynasty of Ādıçūra.[1]

Now this account seems to be borne out by the evidence of the copper-plate.

कण्ठे श्रीश्रेष्ठपत्रं मलयजतिलकैरेति कोलाञ्च देशात्
शाखान्नारायणश्रीः स निज परिकरैर्भट्टनारायणोऽयं ॥
राजा श्रीधर्मपालः सुरसुरंधुणीतीरदेशे विधातुं
मामादिगाञो विप्रं गुणयुततनयं भट्टनारायणस्य ।
यज्ञान्ते दक्षिणार्थं सकनकरजतैर्धामसाराभिधानं
ग्रामं तस्मै विचित्रं सुरपुरसदृशं प्राददत्पुण्यकामः ॥
शाण्डिल्यगोत्रजातानां वरेन्द्रेऽसौ द्विजन्मनां ।
आदिस्ततो जयमाणिभट्टोजश्च तु नन्दनः ॥

See p 117 of "*Gauṛē Brāhmana,*" by Bābū Mahımā Chandra Mızumdar Edition 1886

[1] Thus Harı Mıçra writes —

आपालप्रतिभूर्भुवः पतिरभूद् गौडे च राष्ट्रे ततः
राजाभूत् प्रबलः सदैव प्ररणः श्रीदेवपालस्ततः ।
प्रज्ञावाक्यविवेकशीलविनयैः सुज्ञाशयः श्रीयुतो
धर्मे चास्य मतिः सदैव रमते स स्तौयवशोद्भवे ॥

See "*Vıçva Kōṣa*" by Nāgēndra Nātha Ghōsh, article *Kulīna*, page 308 In this verse we have evidence that the religion of the Pālas was a mixture of the Vedic and the Buddhistic doctrines In fact, a fusion of the two religions was taking place at this period, the result of which was the total absorption of the Buddhists in the ranks of the "Hindūs," by which name the followers of the mixed religion came to be designated by their Musalmān conquerors

According to this evidence, certain pious Brāhmaṇas of the *Lāṭa* country were already established in the territory of Pauṇḍravardhana, as the guardians of a temple, and Bhaṭṭa Nārāyaṇa came to them as a friend.

To students of classical Sanscrit, *Lāṭa* is known as a seat of learning, which gave its name to a peculiar style of alliterative composition, known as *Lāṭ-ānuprāsa* I think it was a district of Kannauj, the same as the country of *Kōlāñca*, of our tradition, whence the five Brāhmaṇas came to Bengal (then Puṇḍra) at Ādiçūra's invitation.[1]

Thus the five Brāhmaṇas preceded Bhaṭṭa Nārāyaṇa into this country by some time They came at the invitation of the traditional Ādiçūra (that probably was his title) whose dynasty shortly afterwards was overthrown by the Pālas

The Pālas are known in history as kings of Gauḍa We are all familiar with the name of the great city of Gaur, the capital of Bengal down to the time of Akbar, of which the ruins [2] can still be seen in the district of Malda But we are not equally familiar with the fact that in the earlier centuries of the Christian Era, there were, on the north of the Ganges, as many as five kingdoms, or principalities, of the name of Gauḍa, or Gauṛ, extending from Oudh (Ayōdhyā) on the west, to Puṇḍra, or Paundravardhana on the east These were collectively known as *Pañca Gauda.* The kings of these five Gaudas had political relations with the great king of Kannauj on the west, sometimes even with the kings of Kāçmīr still further west, and with the king of Pauṇḍravardhana on the east. Harṣavardhana, or Çilāditya, of Kannauj, the contemporary of Hiuen Tsiang, is said to have invaded Gauda, and some of the kings of Kāçmīr also are recorded to have done the same thing and to have carried off a number of their people into Kāçmīr as captives. Then in the history of Kāçmīr we read of an interesting event In the middle of the 8th century, a king of Kāçmīr, Jayāditya or Jayapīda, visited Pauṇḍravardhana *incognito* The king of Paundravardhana, Jayanta, however, came to know who he was, and secured his friendship by giving him his daughter in marriage. With the assistance of his powerful son-in-law, king Jayanta, it is said, conquered the kings of the five Gaudas

It is conjectured by some writers that this Jayanta was no other than the Ādiçūra of our traditions. If there be any truth in the accounts of the early genealogical writers, who place the reign of Ādiçūra shortly before the rise of the Pāla dynasty, the conjecture would seem to be well founded.

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[1] [It has hitherto been considered as corresponding to central and southern Gujarāt, see *Indian Antiquary*, Vol XXII (1893), p 183 Ed]

[2] To the east of the ramparts of the old city is an extensive swamp locally known as Bhatiār Bīl The village of Khālimpur, where the copper-plate under notice was discovered, is on the eastern edge of this swamp

We learn from the copper-plate that a time of great commotion and political turmoil preceded the rise of the Pāla dynasty The country was torn with internecine war, and the people everywhere longed for a strong ruler who would restore peace and order The sceptre of Çīlāditya had fallen into weaker hands, and in the midst of these disorders Gōpāla rose to supreme power in Gauda, in the latter part of the 8th century, and was everywhere welcomed by the subject people as a great deliverer. By Gauḍa here we must understand the five Gaudas, comprising North Bihār and Oudh Gōpāla was succeeded by his son Dharma Pāla, who threw a bridge of boats across the Ganges, and with a host of cavalry, "Supplied by the many vassal kings of the North," overran the country on the south bank of the great river, and established himself at Pāṭalīputra Towards the west his victories extended over Kanauj, which, it would seem, was at that time, reduced to a state of subjection to foreign princes, *viz*, the Bhōjas, the Madras, &c., and which he liberated from them, restoring its king to his paternal throne

The kingdom of Paunḍravardhana had, we find, become absorbed into the dominions of Dharma Pāla for the villages to which the grant relates were all situated within that kingdom which now became part and parcel of Gauḍa.

Bhaṭṭa Nārāyaṇa, the grantee, is well-known to the learned as the author of the drama *Vēnī Samhāra*, the last great work of the imaginative art in classical Sanskrit, in point of time. The drama is largely quoted in the *Avalōka* of Dhanika—the commentator of the *Daça-rūpaka*—who according to Dr. Hall was living about the middle of the 10th century At the end of this drama there is a verse, in which the poet deplores the decay of poetry in his age. The royal patrons of poetry he writes, "have flown away like swans"[1] Is this an allusion to Harṣa Vardhana, the royal patron of Bhaṭṭa Vāna? The *Vēnī Samhāra*, itself, may be nothing more or less than a patriotic though covert appeal to the poet's countrymen, the Pāñcālas, to remember their disgrace, as the daughter of the old king of Pāñcāla, the heroine of the

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[1] The entire verse runs as follows —

काव्यालापसुभाषितव्यसनिनस्ते राजहंसा गता-
स्ता गोष्ठ्यः क्षयमागता गुणलवश्लाघ्या न वाचः सताम् ।
सालङ्कार-रस-प्रसन्न मधुराकाराः कवीनां गिरः
प्राप्ताः नाशम्—अयन्तु भूमिवलये जीयात् प्रपञ्चो महान् ॥

Mahābhārata, remembered her own disgrace at the hands of Duḥçāsana. Bhaṭṭa Nārāyana was a learned man and a genius. But there was no reward for his learning, and no recognition of his genius in the land of his own birth Some of his countrymen had gone to Pauṇḍravardhana at the invitation of its king and in search of fortune, he too, seems to have followed in their wake Such, it seems to me, was the real history of this great Brāhman, the list of whose descendants in modern times includes such names as the late Rājā Rām Mōhan Rāy, the late Pandit Īçvara Chandra Vidyāsāgar, the Mahārāja Sir Jōtēndra Mōhan Tagore, Kt, Bābū Hēm Chandra Banerjee, the poet, the Honorable W C Bonnerjea, the Advocate, the Honorable Dr. Guru Dās Banerjee, the judge, the Honorable Surēndra Nāth Banerji, the orator, and last, though not least, Mahāmahōpādhyāya Mahēśa Chandra Nyāyaratna, C I E, one of the most eminent of our living Pandits.

Having come into Paunḍravardhana, Bhaṭṭa Nārāyaṇa found a patron, not in Ādiçūra, as has been hitherto believed, but in one Nārāyana Varman, who in the copper-plate grant is described as the *Mahāsāmantādhipati*, of Dharma Pāla. *Sāmanta* means a vassal prince or chief. Nārāyana Varman would therefore seem to have been the head of the Imperial Department in which the Emperor's business relations with Sāmantas was transacted

It was at the recommendation of Nārāyana Varman that Dharma Pāla, while encamped at Pāṭalīputra, in the 32nd year of his reign, issued this copper-plate grant in favour of Bhaṭṭa Nārāyana. It was a princely gift which, valued in the currency of our day, would be worth more than a lakh of rupees, and shows in what great esteem the Bhaṭṭa was held in the land of his adoption It is remarkable that the grant was made by a Buddhist king to a Brāhman, on the recommendation of a high officer of State whose name shows that he was a Kṣatriya.

For administrative purposes the territory of Paunḍravardhana was divided into a number of *Maṇḍalas*, or circles and these again were sub-divided into a number of *Visayas.* The copper-plate mentions the *Mandalas* and the *Visayas* in which the four villages, the subject matter of the grant, were situated There was a Record Office in each *Viṣaya*, the President of which was the *Visaya-pati.* Now it is most important to note that this officer had nothing to do with the collection of the revenues The "Collector" appears in the copper-plate grant as the *Sasṭhādhikṛta* and the "Magistrate" as the *Daṇḍa-çakti* The *Visayapati* was the keeper of the Revenue Records of his charge he was in fact the officer who under the Muhammadans became the *Qānungo.* The head ministerial officer of the *Visaya* office, was the *Jyēsṭha-kāyastha*, and the *Visayapati*, it would seem, took cognizance of all judicial questions relating to land and land revenue. Under him was an officer, named *Dāçagrāmika*, or the superintendent of ten villages which shows that there was a further administrative sub-division of ten-village groups, the village, or *grāma*, being then, as now, the lowest unit in the chain of administrative division.

The office of the *Jyēṣṭha-kāyastha* shows that there were inferior *Kāyasthas*, or writers (or Paṭwāris, as we now call them), in the villages within the jurisdiction of the *Visaya*.[1] In other words, Kāyasthas must have been numerous in Bengal when Bhaṭṭa Nārāyaṇa came. Thus the tradition about the Kāyasthas of Bengal being the descendants of the five Kāyastha servants of the five Kānnaujiā Brāhmans now seems to be a pure myth It may be true that Āḍiçūra invited five Brāhmans as well as five Kāyasthas from the civilized and advanced province of Kannauj, to introduce spiritual and secular reforms in Bengal, but it does not follow that at that time there were no Brāhmans or no Kāyasthas in Bengal at all

As regards the territory of Pauṇḍravardhana, or Pundra, there can be no doubt that originally it meant North Bengal, and may have included Baŋga proper, or Eastern and Deltaic Bengal also. The capital was at the place now occupied by the extensive ruins of Panduā, properly *Pāruā*, in the district of Maldaḥ, on the east of the Mahānanda. A great branch of the Ganges (now known as the Kālindī) originally joined the Mahānanda river, close to the ancient city of Puṇḍra, which being thus at the confluence of two great rivers rapidly rose in wealth and power It existed as the capital of an independent kingdom down to the latter part of the 8th century, when, as the copper-plate shows it became absorbed in the dominion of the Pālas A new and a rival capital on the west bank of the Mahānanda, near its junction with the Kālindī, appears to have arisen under the Pālas, or shortly before the rise of that dynasty, and this ultimately became the Gauṛ of Muhammadan history

In the district of Malda we still have an important caste called Puṇḍarī, or Pūrá, the members of which were returned at the last census at 9,000 in round numbers. They seem to be the descendants of the ancient Puṇḍras—at one time the ruling caste in the country. They are a pushing race, numbering in their ranks pleaders Government clerks, money-lenders, and traders Many of them work as rearers of silk-worms and weavers of silken fabrics. They form a rich and influential caste, but even to this day they have not succeeded in securing the services of pure Brāhmans as priests They have a quarter of their own in the town of English-bazār, known as *Pūrātulī*.

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[1] These inferior officers are the *Karanas* of the copper plate.

Dharma Pāla's successors after a time seem to have been driven more and more towards the East, as Kannauj, we find, gradually recovered much of its lost ground. The last king of the Pāla dynasty—according to a Sanskrit Manuscript which I have unearthed from the Muhammadan Mosque at Panduā,—was *Rāma Pāla*, and the manuscript gives the date of his death, as the year 922 of the Çaka Era. I think this is a mistake for 977 Çaka Era, which would correspond to 1055 A. D. The wording of the chronogram is शाके युग्म-रेणु रन्ध्रगते (written in Bangāli character)—where रेणु I think, is a clerical mistake for वेणु [1]

This slight clerical mistake being corrected, the result is 977 Çaka Thus the Pālas reigned for nearly three centuries at first over a wide empire spreading from the borders of Kannauj to East Bengal, but latterly over Northern and Eastern Bengal mainly, with their capital very near to the present town of English-bazār, where the remains of the palace of Ballāla Sēna are still pointed out The Muhammadan city of Gaur sprung up a little to the south of the old Hindū capital.

TRANSLATION.

PROSPERITY—

May the Ten Forces of Vajrāsana,[2] who has steadfastly accepted omniscience as the greatest good, protected by the Great Queen, Benevolence, and victorious over the ten quarters of the globe, where numerous hosts of Māras are seen,—protect you!

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[1] The *Çlōka* containing this date (as corrected above) runs thus —

शाके युग्म-वेणु-रन्ध्र गते कन्यां गते भास्करे
कृष्णे वाक्पतिवासरे यमतिथौ यामद्वये वासरे ।
जाह्नव्यां जलमध्यतस्त्वनशनैर्ध्यात्वा पदं चक्रिणो
हा पालान्वयमौलिमण्डनमणिः श्रीरामपालो मृतः॥

Chapter XI of the MS वेणु is a flute, expressing the 7 notes of the gamut. It thus stands for 7. युग्म-वेणु yields 77 रन्ध्र refers to the 9 openings of the human body, and thus stands for 9 Following the principle अङ्कस्य वामा गतिः the whole thing means 977. The exact date, as above given, is year 977 Çaka . month *Kārttika* (when the sun enters the sign of *Virgo*) the 14th day of the waning moon. Thursday noon

[2] Vajrāsana is a name of the Buddha. The Ten Forces are thus enumerated * Charity, good character, mercy, bravery, meditation, prudence, strength, means of performance, attention, and knowledge. The *Māras* are the evil passions personified

* दानशील-क्षमा वीर्य्य-ध्यान-प्रज्ञा बलानि च ।
उपायः प्रणिधिर्ज्ञानं दश बुद्धबलानि वै ॥

Dayitaviṣnu, adorned with all kinds of learning, was the progenitor of the excellent race of *Avampālas,* just as the ocean is the progenitor of the beautiful Goddess Çri, and as the moon is the progenitor of that light which delights the whole earth.

From him sprung *Çrī Vapyata,* the highly honoured, the successful, who overthrew his enemies, and adorned the earth as far as the sea with great deeds.

His son was *Çrī Gōpāla,* the crown jewel on the head of all rulers of the earth. The subjects made him take the hand of *Laksmī,*[1] to put an end to the practice of fishes Even the whiteness of the full-moon night but faintly imitates, in the several quarters of the globe, the splendour of his great and lasting reputation

Even as Rōhiṇī is of the moon, and Svāhā is of the resplendent God of Fire, as Çarvānī is of Çiva, and Bhadrā is of Kuvēra, as Çaci is of Indra, and as Lakṣmī is of Viṣnu—so was *Çrī Dēdda Dēvī,* the daughter of the king of the Bhadras, the Queen of that Lord of Earth, in whose company he sought for the relaxation of his mind.

From these two sprung *Çrī Dharmapāla,* honoured by hosts of good men. The Lord of all Rulers of Earth, alone he ruled over the circle of the whole earth. The four oceans—the ditches of the earth, whose shores bear the foot-prints of his war elephants plunging into their waters, even they cannot stop his march, when he goes forth to conquer the four quarters.

When with exuberant glee his armies move to conquer the four quarters of the globe, and the earth in consequence loses her balance, as if with her mountains moving to and fro, the Snake-god Çēṣa, underneath the Earth with his circle of heads, smarting under the great pressure, which makes the jewels sink in their sockets, has to follow his march with uplifted hands.

When his armies depart, and with their movements fill all the regions of the sky with heaps of dust, the Earth grows extremely light, and the hoods of the Snake-god, with their jewels emerging again, feel a great relief.

When he invades a hostile territory, his anger burns like the ocean fire, unquenchable, knowing no other limit than the four seas.

There were great rulers of the earth in ancient times, such as Pṛthu, Rāma, the descendant of Raghu, Nala, and so forth. The Creator wishing to see all of them put together, has in the Kali-yuga raised this pillar of a king, *Çrī Dharmapāla*, who has surpassed the honour and greatness of innumerable kings, to which the fickle Goddess of Prosperity, like a she-elephant, is tied for ever.

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[1] To 'take the hand of Lakṣmī' is to assume the sovereign power. 'Practice of fishes' means civil war, where men kill each other as one fish devours another It would appear that Gōpāla's father, Vapyata, was a chief of some sort, but Gōpāla himself became a great king, and put an end to the anarchy and civil war which then distracted Northern India.

The God Indra, when suddenly he sees the ten quarters of the globe whitened by the dust raised by the vanguard of his army, and fancies it to be the approach of the army of Māndhātā, shuts his eyes and ponders. But there is no occasion to-day for his all-conquering arms rendering the assistance of his warlike troops to Indra.[1]

Who, unto the king of Kannauj gave his own (the king's) golden coronation vessel, of excellent make, uplifted by the delighted elders of the Pāñcālas, the water wherefrom was all at the same time poured out by the kings of the Bhōjas, the Matsyas, the Madras, the Kurus, the Yadus, the Yavanas, the Avantis, the Gāndhāras and the Kīras, doing obeisance to him with their moving crowns while his own face bore the mark of beautiful quivering eyebrows.[2]

He constantly hears his praises sung by cowherds moving about in forests, while tending their cattle in the jungles on the out-skirts of villages, by the children playing in every house-court, by the keepers of the market-places, by the parrots in cages in the house of pleasure, and his face therefore is always downcast with modesty

From his victorious encampment established at Pāṭalīputra, where a bridge constructed across the stream of the Bhāgīrathī, with boats of various kinds, is mistaken for the row of hills of the Sētubandha, where countless troops of war-elephants blackening the light of day, produce the impression of the rainy season, where the horizon is grey with the dust raised by the sharp hoofs of the hosts of cavalry contingents supplied by many kings of the North, where the earth sinks under the weight of the endless array of foot-soldiers of all the kings of Jambudvīpa assembled for rendering service to the highest amongst kings, the devout follower of Sugata, always thinking of the feet of the Mahārājādhirāja *Çrī Gōpāla Dēva*, the highest among kings, the highest among lords, the prosperous *Dharmapāla* (thus sayeth) :—

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[1] Māndhātā used to assist Indra in his war with the enemies of the Gods The meaning of the text is that, under the sway of Dharmapāla, the enemies of the Gods had ceased to exist.

[2] I am indebted to Mr Grierson for pointing out to me that, according to the Bhagalpur Copper-plate Grant of Nārāyaṇa Pāla, Dharmapāla conquered the Bhōjas, the Matsyas, the Madras, &c, and thereby liberated the Pāñcāla country The meaning of the words सललित-चलित भ्रूलतालक्ष्म is somewhat obscure I have construed it thus ललित-चलित-भ्रूलतालक्ष्मणां सह यथा स्यात् तथा making it thus an adverb to दत्तः।

The village named *Krauñca-Çvabhra*, in the *Viṣaya* of *Mahantāprakāça*, in the *Maṇḍala* of *Vyāghrataṭī*, in the territory of *Puṇdra Vardhana.*

Its boundary :—On the west, *Gayginikā*, on the north, *Kādambarī's* temple, and a date tree, on the north-east, the embankment constructed by the Rājaputra *Dēvaṭa*, extending to the grove of lemons, on the east, the embankment *Viṭaka*, extending to the artificial water-course; skirting the water-course lined with Jambu trees, the boundary line proceeds as far as the said water-course Emerging thence it extends as far as the minor stream near the Vilva tree of the sacred grove emerging whence again * * * * * *[1]

Also the village named *Māṭhā-Çāmmralī.*

Of this also the boundary on the north is *Gayginikā*; thence on the east, passing along the minor stream, is the water-course lined with mango trees, extending to the * * * * water-course[2] Emerging thence again on the south, is the village *Kālikā Çvabhra* Emerging thence it goes so far as *Çrī-phalabhi-suka* on the west, whence again, along the minor stream near the Vilva tree, it enters *Gayginikā*

In the village *Pālitaka*, the boundary on the south is the *Kānā* island, on the east, the stream of the *Kaumiyā*, on the north, *Gayginikā*, on the west, the *Jainanyāyikā*: the said island (*Kāṇā*) is the burning-ground of this village

The boundaries of village *Gōpippallī*, in the *Visaya* of *Sthālīkkaṭa*, in the *Maṇḍala* of *Āmrasāndikā* On the east, the western boundary of the lands of *Udragrāma*, on the south, a marsh, on the west, an old river-bed named *Vaiçānikā*, on the north, a cattle-path marking the boundary between it and *Udragrāma.*

To all (in authority) assembled in these four villages, Rājas,[3] Rājanyas,[4] Rājaputras,[5] Rājāmātyas,[6] Sēnāpatis,[7] Viṣayapatis,[8] Bhōgapatis,[9] Ṣaṣṭhādhikṛtas,[10] Daṇḍaçaktis,[11] Daṇḍapāçikas,[12] Caurōddharṇikas,[1] Dōssādhasādhanikas,[2] Dūtas,[3] Khōlas,[4] Gamāgamikābhitvaramānas,[5] Hastyaçvagōmahisyajāvikādhyakṣas,[6] Nākādhyakṣas,[7] Valadhyaksas,[8] Tarikas,[9] Çaulkikas,[10] Gaulmikas,[11] all persons holding either temporary or permanent commissions, and other servants of the king not named herein of the Cāṭa[12] and Bhaṭa tribes (in particular) to the Jyēṣṭha Kāyastha,[13] Mahāmahattara,[14] Dāçagrāmika,[15] and other incumbents of the *Visaya* office, appointed from time to time, with all their subordinate writers and accountants,[16] and to all resident cultivators (to all persons above

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[1] The translation of the boundaries of this village is to be taken as tentative

[2] The text is here somewhat illegible

[3] *Rāja* = subordinate chiefs, who under the Muhammadans became Zemindars.

[4] *Rājanya* = the followers and dependants of Rājas.

[5] *Rājaputra* = persons of royal lineage.

[6] *Rājāmātya* = ministers of the king

[7] *Sēnāpati* = commanders of troops.

[8] *Viṣayapati* = presidents of the *Viṣaya* office.

[9] *Bhōgapati* = purveyors

[10] *Ṣaṣṭhā-'dhikṛta* = collectors of revenue.

[11] *Danda-çakti* = magistrates

[12] *Daṇḍa-pāçika* = executioners of sentences on criminals

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[1] *Caur-'ōddharanika* = discoverers of thieves, or police officers

Dōs-sādha-sādhanika = executors of all works to be done by manual labour, answering to Public Works officers of our day

[3] *Dūta* = political agents

[4] *Khōla* = ? spies. (The word means a lame man, in vulgar language it also means a jackal)

[5] *Gamāgamikā-'bhitvaramāna* = the expediter of messengers the head of the staff of peons

[6] *Hasty-açva, &c* = superintendent of elephants, horses, kine, buffaloes, goats and sheep

[7] *Nākā-'dhyaksa* = chiefs of police stations. (This is conjectural, the word *Nākā* is locally used to denote a police out-post)

[8] *Valā-'dhyakṣa* = Commander-in-Chief of land forces.

[9] *Tarika* = commander of naval forces

[10] *Çaulkika* = customs officers

[11] *Gaulmika* = commanders of garrisons or military stations

[12] *Cāṭa* and *Bhata* seem to have been menial officers of the Intelligence Department, who moved about the country for collecting secret information and became in course of time the pests of society The word *Cāṭa* became the synonym for a deceiver

[13] *Jyēṣṭha Kāyastha* = the head-writer, or head ministerial officer of the *Viṣaya* office

[14] The word *Mahattara* seems to be twice engraved by mistake The *Mahattara* was the officer whose name still survives in the grants known as *Mahāttran*

[15] *Dāça-grāmika* = superintendents of ten villages The ten-village administrative divisions were included in the jurisdiction of the *Viṣayas*, which I think answered the same purpose as parganas under the Muhammadans

[16] The original for this is *sa karanān* *Karana*, was but another name of *Kāyastha*, the great caste of Writers and Accountants under the Hindū kings, and of Patwaris of our own times, from whose oppressive dealings and sharp practices the kings were particularly enjoined to protect their subjects Thus we have an ancient text

चाटतस्करदुर्व्वृत्तमहासाहसिकादिभिः ।
पीड्यमाना प्रजा रक्षेत् कायस्थेभ्यो विशेषतः ॥ याज्ञवल्क्य ॥

About the identity of the *Karana* with the *Kāyasthas* it may be noted, that in social gatherings of *Kāyasthas* now-a-days, it is customary first of all to salute enumerated) the king, after paying his respects to the Brāhmanas,[1] conveys his greetings, sends his message, or issues his commands (as may be appropriate in each case) —

Be it known unto you —

Our Mahāsāmantādhipati,[2] Çrī Nārāyaṇa Varman, by the mouth of the Yavarāja Çrī Tribhuvana Pāla, the messenger, addresses us as follows —

"We, for increasing the merit of our father and mother, as well as of self have caused a House of God to be erected at *Çubhasthalī* There have we established the God-guided Bhaṭṭa Nārāyana, who came to visit the Brāhmanas of the *Lāṭa* country, whom we appointed as the guardians and worshippers of the said House of God.

"For the performance of the offices of religion in the said House, may your Majesty be pleased to grant to the said Bhaṭṭa Nārāyana four villages, together with their markets, roads, and everything on the surface."

Then we, in pursuance of his recommendation, have in the terms of his address, established and granted these above-written four villages, with markets, roads, and everything on the surface, as far as their respective boundaries, as also with everything above them, together with the ten *apacāras*, free of all tribute, and free from all coercive measures. May this grant last, like the pores of the earth, as long as the sun and the moon!

Wherefore, all of you, out of respect for the merit attaching to grants of lands, and out of fear of falling into the great hell that awaits those who deprive people of their lands, should respect this grant, after giving your assent to the same.[3] And all resident cultivators are hereby commanded to submit to these orders, and to pay their appropriate rents, food supplies, and all other tributes (to the grantees)

Many kings, like Sagara and others, made grants of lands, whoever rules the earth, at any one time, to him, for that time, belongs the merit of these grants.

Brāhmanas with the words ब्राह्मणेभ्यो नमः, and afterwards to salute *Kāyasthas* with श्री करणेभ्यो नमः।

[1] The Brāhmanas, it must be remembered were the repositories of the law in those days whence their mention here.

[2] The *Sāmantas* were the subordinate chiefs under the Hindū kings A royal officer, superintended the king's business relations with his *Sāmantas* and it was this officer, whose title was the *Mahā-sāmantā-'dhipati*

[3] The words "after giving your assent to the same" would indicate that the grant had to be registered in the *Viṣaya* office.

The grantor of land enjoys happiness in heaven for sixty-thousand years the robber of land, and he who assents to the robbery, go to hell for the same period

Whoever robs lands granted by himself or by another rots as a worm in hell with his ancestors Wherefore, let no man who understands all this destroy the reputation of others who grant lands, after pondering that life and prosperity are unstable like the drop of water on a lotus leaf.

Prosperity is like the flash of lightning; this body of ours is like the flame of a lamp. Life is hedged in by sorrow Those who destroy the good deeds of others, reap nothing but bad repute, while the fame of those who maintain them is lasting as the sun and the moon. But what use of quoting texts? In this matter kings will do what appears to them best after reflection.

In the prosperous and victorious reign, year 32, days of Mārga, 12.

This plate has been engraved by the skilful Tātaṭa, son of Subhaṭa, grandson of Bhōgaṭa.[1]

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[1] In translating the text, where it refers to the grantee, I have assumed Bhatta and Bhaṭṭāraka to be the same —As regards the country of Lāṭa, it is interesting to note—that it is referred to in the Mandasōr Inscription of Kumāra Gupta and Bandhuvarman (*Indian Antiquary*, Vol XX, p 196) There we are told that the famous guild of silk-weavers who built the temple of the Sun at Daçapura originally came from the province of Lāṭa, which is described in these words —

कुसुमभरानततरुवर
देवकुलसभाविहाररमणीयात् ।
लाटविषयान्नगावृतशैलाज्
जगति प्रथितशिल्पाः ॥
ते देशपार्थिवगुणापहृताः प्रकाशम्
मध्वादिजान्यविरलान्यसुखान्यपास्य ।
जातादरा दशपुरम्प्रथमम् मनोभिः
रन्वागताः ससुत बन्धुजनाः समेत्य ॥

This description seems to be applicable to Kannauj Hiuen Tsiang saw a large temple of the Sun, built of blue stone, in Kannauj, on the bank of the Ganges, and it was probably in imitation of the same that the *Lāṭa* weavers built the temple of the Sun at Daçapura

श्रीमान्धर्म्मपालदेवः ।

OBVERSE.

L. 1 स्वस्ति

सर्व्वज्ञतां [illegible]मास्थितस्य वज्रास

L. 2 नस्य भङ्गमारकुलोपलम्भाः ।

देव्या महाकरुणया परिपा

L. 3 लितानि

रक्षन्तु वो दशबलानि दिशो जयन्ति ॥ [1]

श्रियइव सुभगा

L. 4 याः सम्भवो वारिराशि

शशधरइव भासोविश्वमाह्लादयन्त्याः ।

प्रकृतिरवनिपानां सन्ततेरुत्तमाया

श्च

L. 5 जनिदयितविष्णुः सर्व्वविद्यावदातः ॥ [2]

आसीदासागरादुर्व्वीं गुर्व्वीभिः कीर्त्तिभिः कृती ।

मण्डयन्

L. 6 खण्डितारातिः श्लाघ्यः श्रीवप्यटस्ततः ॥ [3]

मात्स्यन्यायमपोहितुं प्रकृतिभिर्लक्ष्म्याः करग्राहितः

श्रीगोपा

L. 7 ल इति क्षितीशशिरसां चूडामणिस्तत्सुतः ।

यस्यानुक्रियते सनातनयशोराशिर्दिशामाशये

श्वेतिम्ना य

L. 8 दि पौर्णमासरजनीज्योत्स्नातिभारश्रिया ॥ [4]

शीतांशोरिवरोहिणी हुतभुजः स्वाहेव तेजोनिधेः

शर्व्वाणी

L. 9 वशिवस्य गुह्यकपतेर्भद्रेव भद्रात्मजा ।

पौलोमीव पुरन्दरस्य दयिताश्रीदेद्ददेवीत्यभूत्
देवीतस्य विनो
L. 10 दभू- रिपोर्लक्ष्मीरिव क्ष्मापतेः ॥ [5]
ताभ्यां श्रीधर्म्मपालः समजनिसुजनस्तूयमानावदानः
स्वामी भूमी
L. 11 पतीनामखिलवसुमती मण्डलं शासदेकः ।
चत्वारस्त [illegible] गयाचरयान्यस्तमुद्राः समुद्रा
यात्रां य
L. 12 स्य क्षमन्ते न भुवनपरिखाविश्वगाशाजिगीषोः ॥ [6]
यस्मिन्नु ामलीलाचलितवलकरे दिग्जयायप्रवृत्ते
यान्त्या
L. 13 म्विश्वम्भरायां चलितगिरितिरश्चीनतां तद्वशेन ।
भाराभुग्नावमज्जन्मणिविधुरशिरश्चक्रसाहायकार्य्य
प्रोषे
L. 14 ष्योदस्तदोष्णात्वरिततरमधोधस्तमेवानुयातम् ॥ [7]
यत्प्रस्थाने प्रचलितवलास्फालनादुच्छलद्भि
र्धूलीपूरैः पिहि
L. 15 तसकलव्योमभिर्भूतधात्र्याः ।
सम्भारायाः परमतनुतां चक्रवालं फणानां
मर्म्मोन्मीलन्मणिफणिपतेस्त्रा
L. 16 घवादुच्छलास ॥ [8]
[illegible] नाद् यस्य कोपाग्निरौर्ववत् ।
अनिर्वृति प्रजज्वालचतुरम्भोधिवारितः ॥ [9]
L. 17 येऽभुवन्पृथुरामराघवनलप्रायाधरित्रीभुज
स्तान्येकत्रदिदृक्षुणेव निचिता- व्वान्समम्बेधसा ।
च्व
L. 18 स्तापेष नरेन्द्रमानमहिमा श्रीधर्म्मपालः कलौ
लोक श्रीकरिणीनिवन्धनमहास्तम्भः समुत्तम्भितः ॥ [10]

यासां

L. 19 नासीरधूलीधवलदशदिशां द्रागपश्यन्नियत्ता
धत्ते मान्धातृसैन्यव्यतिकरचकितो ध्यानतन्द्रीम्महेन्द्रः ।

L. 20 तासामद्याहवे पुलकिततवपुषाम्भ्यताह बीराभिधातुं
साहाय्यं यस्य बाह्वोर्निखिलरिपुकुलध्वंसिनोर्वा

L. 21 वकाशः ॥ [11]
भोगैर्मत्स्यैः समद्रैः यदुयवनावन्ति गंधारकीरैः
भूपैर्व्यालोलमौलिप्रणतिपरिणतः

L. 22 साधुसङ्गीर्यमाणः ।
हृष्यत्पंचालवृद्धोद्धृतकनकमयस्वाभिषेकोदकुम्भो
दत्तः श्रीकान्यकुब्जस्सललितच

L. 23 लितभ्रूलतालक्ष्मयेन ॥ [12]
गोपैः सीम्नि वनेचरैर्वन विग्रामोपकण्ठेजकैः
क्रीडद्भिः प्र[illegible]स्सुगणैः

L. 24 प्रत्यापणस्थानपैः ।
लीलावेश्मनिपञ्जरादरशुकैः गीतमात्मस्तवं
यस्याकर्णयतस्त्रपाविवलितानम्रंस

L. 25 दैवाननं ॥ [13]
स खलु भगीरथीपथप्रवर्त्तमाननानावि[illegible]नौवाटकस[illegible]दितसेतुबन्धनि
हितशैलशि-

L. 26 खरश्रेणीविभ्रमात् निरतिशयघनघनाघनघटाश्यामायमानवासरल[illegible]ी
समारब्धसन्ततजलदस-

L. 27 मयसन्देहात् उदीचीनानेकनरपतिप्रभृतीकृताप्रमेयहयवाहिनीखरखु
रोत्खातधूलीधूसरित दि-

L. 28 गन्तराजात् परमेश्वरसेवासमायातसमस्तजम्बुद्वीपभूपालानन्तपादातभर
नमदवनेः पाटलीपु-

L. 29 त्रसमावासितश्रीमज्जयस्कन्धावारात् परमसौगतोमहाराजाधिराजश्री
गोपालदेवपादा-ध्यातः प-

L. 30 रमेश्वरः परमभट्टारको महाराजाधिराज श्रीमान्धर्म्मपालदेवः कुशली ॥ श्रीपुण्ड्रवर्द्धनभु-

L. 31 क्त्यन्तःपाति [illegible] मण्डलसम्बद्ध महन्ताप्रकाशविषये क्रौञ्चश्वभ्रनाम ग्रा-मोऽस्य च सीमा पश्चि-

L. 32 मेन गङ्गिनिका उत्तरेण कादम्बरीदेवकुलिका खर्ज्जूरवृक्षश्च। पूर्व्वोत्तरेण राजपुत्र देवटकृतालिः। वी-

L. 33 जपूरकङ्गत्वाप्रविष्टा पूर्व्वेण विटकालिः खातकयानिकांगत्वाप्रविष्टा जम्बु-यानिकामाक्रम्य जम्बुयानकं

REVERSE.

L. 34 गता। ततो निःसृत्य पुण्ड्रारामविल्वार्द्ध स्रोतिका। ततो पि निःसृत्य न-

L. 35 लचर्म्मटोत्तरान्तं गता। नलचर्म्मटात् दक्षिणेन नामुण्डिकायिके

L. 36 ··· कायाः खण्डमुण्डमुखं खण्ड-खावेदसविल्विका वेदविल्विकान्तो रो-हितवाटिः पिण्डारविटि जोटिका सीमा-

L. 37 कारजोटस्य दक्षिणान्तः ग्रामविल्वस्य च दक्षिणान्तः देविका सीमा विटि। धर्म्मा योजोटिका। एवम्माढाशाल्मलीना-

L. 38 मग्रामः अस्य चोत्तरेण गङ्गिनिकासीमा ततः पूर्व्वेनार्द्धस्रोतिकया आम्र-यानकोलार्द्धयानिकाङ्गतः त-

L. 39 तोपि दक्षिणेन कालिकाश्वभ्रः। अतोपि निःसृत्य श्रीफलभिषुकं यावत् पश्चिमेन ततोपि विल्वगोर्द्ध स्रोति-

L. 40 कया गङ्गिनिकां प्रविष्टा। पालितके सीमा दक्षिणेन काणाद्वीपिका। पूर्व्वेण कोविधयास्रोतः उत्तरेण

L. 41 गङ्गिनिका। पश्चिमेन जे[illegible] । एतद् ग्रामसंपारीण परकर्म्मकृद्दीयं। स्थालीक्कटविषयस-

L. 42 म्बद्धाम्रषण्डिकामण्डलांत पाति गोपिप्पलीग्रामस्य सीमा पूर्व्वेण उडग्राम-मण्डलपश्चिमसीमा। दक्षि-

L. 43 णेन जोलकः पश्चिमेन वेशानिका। [illegible] खाटिका। उत्तरेण [illegible] ली-माव्यवस्थितो गोमार्गः एष च-

L. 44 तुरषुग्रामेषुसमुपागतान्सर्व्वानेव राजराजनकराजपुत्र राजामात्य सेनापति
विषयपति भोगपति षष्ठाधि-

L. 45 कृतदण्डशक्ति दण्डपाशिकचौरोद्धरणिक दौस्साधसाधनिक दूतखोलगमा-
गमिकाभित्वरमान हस्त्यश्वगो महिष्यजा-

L. 46 विकाध्यक्ष नाकाध्यक्ष वलाध्यक्ष तरिक शौल्किक गौल्मिक तदायुक्तक
विनियुक्तकादि राजपादो पजीविनोऽन्यांश्चाकीर्त्ति-

L. 47 तान् चाटभटजातीयान् यथाकालाध्यासिनो ज्येष्ठकायस्थ महामहत्तर
महत्तर दा ग्रामिकादि विषय व्यवहारिणः

L. 48 सकरणान् प्रतिवासिनः क्षेत्रकरांश्च ब्राह्मणमाननापूर्व्वकं यथार्हंमानयति
वोधयति समाज्ञापयति च । मतमस्तु

L. 49 भवतांमहासामन्ताधिपति श्रीनारायणवर्म्मणा दूतक युवराज श्रीत्रिभुवन
पालमुखेनवयमेवम्विज्ञापिता यथाऽस्मा-

L. 50 भिर्म्मातापित्रोरात्मनश्च पुण्याभिवृद्धयेशुभस्थल्यां देवकुलं कारितन्तत्र प्र-
तिष्ठापितभगवन्नन्न*नारायणभट्टारकाय तत्प्र-

L. 51 तिपालकलाटद्विजदेवार्च्चकादि पादमूलसमेताय पूजोपस्थानादिकर्म्मणे चतु-
रोग्रामान् अत्रत्य हट्टिका तल(पा)वादक-

L. 52 समेतान् ददातु देव इति । ततोऽस्माभिस्तदीय विज्ञप्त्याएते उपरिलिखित-
कास्चत्वारोग्रामास्तल(पा)वाटकहट्टिकासमेता स्व-

L 53 सीमापर्य्यन्ताः सोद्देशाः सदशापचाराश्च किंचित्प्रग्राह्याः परिहृतसर्व्व-
पीडाः भूमिच्छिद्रन्यायेनचन्द्रार्कक्षितिसमकालं

L. 54 तथैव प्रतिष्ठापिताः । यतोभवद्भिस्सर्व्वैरेव भूमेर्द्दानफलगौरवादपहरणे च
महानरकपातादिभयात् दानमिदमनुमो-

L. 55 द्यपरिपालनीयं प्रतिवासिभिः क्षेत्रकरैश्चाज्ञाश्रवण विधेयै भूत्वा समुचित
करपिण्डकादिसर्व्वप्रत्यायोपनय. कार्य्यं

L. 56 इति ॥

वहुभिर्वसुधा दत्ता राजभिः सगरादिभिः ।
यस्य यस्य यदा भूमिस्तस्य तस्य तदा फलं ॥ [1]
षष्ठिम्वर्षसहस्राणि स्वर्गे मो

L. 57 इति भूमिदः ।
आच्छेत्ता चानुमन्ता च तान्येव नरके वसेत् ॥ [2]
स्वदत्ताम्परदत्ताम्वा यो हरेत वसुन्धराम् ।
स विष्ठायां कृमिर्भूत्वा पितृ
L. 58 भिः सह पच्यते ॥ [3]
इतिकमलदलाम्बुविन्दुलोलां श्रियमनुचिन्त्यमनुष्यजीवितं च ।
सकलमिदमुदाहृतञ्चबुद्ध्वा नहि पुरु
L. 59 षैः परकीर्त्तयोविलोप्याः ॥ [4]
तडित्तुल्या लक्ष्मी तनुरपि च दीपानलसमा
भवोदुःखैकान्तः परक्षतिमकीर्त्तिं· क्षपयताम् ।
यश्च
L. 60 आचन्द्रार्कं नियतमवतामत्र च नृपाः
करिष्यन्ते बुद्धा यदभिरुचितं किम्प्रवचनैः ॥ [5]
अभिवर्द्धमानविजयराज्ये
L. 61 सम्वत् ३२ मार्गदिनानि १२ ॥

(At bottom of reverse)

L 62 श्रीभोगटस्य पौत्रेण श्रीमत्सुभटसूनुना ।
श्रीमतातातटेनेदं उत्कीर्णं गुणशालिना ॥ [1]

ADDITIONAL NOTE.

The preceding note was written on the assumption that the grantee, whose name appears in the copper-plate as Nārāyana Bhaṭṭāraka, was the same person as Bhaṭṭa Nārāyana the author of the Vēnī Saṁhāra As doubts have been expressed about the correctness of this identification, I proceed briefly to state the reasons on which it is based

The proper name of the author of the Vēnī Saṁhāra was Nārāyaṇa and Bhaṭṭa was his title Thus, in a genealogical work, called Bārēndra Kula Pañjī, we find him described as follows —

नारायणाख्यो यस्तेषां
शाण्डिल्य गोत्र एव च

In another genealogical work called Kula Rāma, he is called शाण्डिल्य गोत्रजं श्रेष्ठो भट्टनारायणः कविः ।

The title Bhaṭṭa could be added either at the beginning or at the end of the name proper, and it would be correct to speak of him either as Bhaṭṭa Nārāyana or Nārāyana Bhaṭṭa. Indeed in some MSS of the Vēnī Saṃhāra the author is called नारायण भट्ट, while in others he is called भट्ट नारायण. Numerous instances can be cited where the title Bhaṭṭa comes after the name proper. Thus, वेताल भट्ट, बाण भट्ट, कुल्लूक भट्ट, &c , &c. The third in descent from Bhaṭṭa Nārāyana was a personage who bore the name of जयमणि भट्ट.

Kullūka Bhaṭṭa, the famous commentator of the Institutes of Manu, in describing his own genealogy, writes as follows —

गौडे नन्दनवासि नाम्नि सुजनैर्वन्द्ये वरेन्द्र्यां कुले
श्रीमद्‌ भट्ट दिवाकरस्य तनयः कुल्लूकभट्टोऽभवत् ।

Thus, while the father was called Bhaṭṭa Divākara, the son was called Kullūka Bhaṭṭa

The next point is the connection between Bhaṭṭa and Bhaṭṭāraka. Here I may quote the authority of Dr Rājēndra Lāla Mitra, that Bhaṭṭa and Bhaṭṭāraka are really interchangeable terms That learned scholar in translating the copper-plate grant of Nārāyana Pāla, rendered the शिव भट्टारक of that plate as Çiva Bhatta See Indo-Aryans, Vol II, p 274 I however, do not follow him blindly. भट्ट, भट्टार, भट्टारक and भट्टिनी form a group of words with a common root Grammarians by no means agree about the correct root. About the signification of the words, however, there is no difference of opinion Bhaṭṭa means a Pandit learned in the Vēda it also means a lord The late Professor Tārānātha Tarkavācaspati defined the meaning thus स्वामिनि वेदाभिज्ञे पण्डिते च । The same authority derives भट्टार thus भट्टं स्वामित्वम् ऋच्छति which means one who obtains lordship, and he gives the meaning as पूज्ये. The word भट्टारक is the same as भट्टार with a स्वार्थे क, *i. e.*, with a क which does not change its meaning at all According to the Amara Koṣa राजा भट्टारको देवः are synonymous words. Professor Tarkavācaspati adds that this use of the word is mostly confined to dramatic speech, and we find that in this sense, it has been applied to the grantor Dharma Pāla in our copper-plate According to the Mēdinī (as quoted by the same learned Professor) भट्टारक also means a तपोधन or a pious Brāhmana, and therefore, in the copper-plate we find it equally applied to the grantee Nārāyana The real connection between the words भट्ट and भट्टारक however is disclosed by the feminine form भट्टिनी which is thus described by Professor Tarkavācaspati भट्टिनी स्त्री॰ भट्ट

स्वामित्वमस्यास्ति इति ङीप । विप्र भार्यायाम्, नाट्योक्तौ अकृताभिषेकायां राज्ञः स्त्रियां च । Thus the feminine form is applied indifferently to a king's wife or to a Brāhman's wife

I am inclined to think that the words भट्ट and भट्टार are really the Prākrit forms of the Sanskrit word भर्त्ता (vocative भर्त्तः) or भर्त्तर. They seem to be radically connected with the Bangālī word भातार husband. That they were really Prākrit words is indicated by the fact that they were mostly used in dramatic speech. Being in common use, the words forced recognition even from Paṇḍits and were sanskritized. The derivation points to an individual who "supported" others. A learned Brāhmana, who supported a host of pupils or dependants was a भट्ट or भट्टार or भट्टारक, and a Rājā who supported many people was a भट्टारक or lord and the wife of both was a भट्टिनी ।

It will thus appear that philologically there is no difference between Bhaṭṭa Nārāyana, and Nārāyana Bhaṭṭāraka

The question still remains whether the author of the Vēnī Samhāra is identical with our Nārāyana Bhaṭṭāraka If we looked to the copper-plate alone the point might remain doubtful but as pointed out in the preceding note, fortunately we possess independent evidence, from which we know that the author of the Vēnī Samhāra was really a contemporary of Dharma Pāla The value of the copper-plate lies in confirming this evidence

The copper-plate shows that very intimate relations subsisted between Dharma Pāla, and the king of Kannauj, the former having restored the latter to his throne That a poet of the Pañcāla country as Bhaṭṭa Nārāyana was, should be patronized by Dharma Pāla need not therefore surprise us There are one or two points in the Vēnī Samhāra itself, that deserve mention in this connection We have already alluded to the Çlōka in which the poet deplores the decay of the poetic art through want of royal patronage in his own native country I think the Vēnī Samhāra was composed in the native land of the poet In the concluding verse he pointedly solicited the patronage of his king in the following lines —

दयित-भुवनो विद्वद्बन्धुर्गुणेषु विशेषवित् ।
सतत सुकृती भूयाद् भूपः प्रसाधितमण्डलः ॥

He hoped that his own king, the king of Kannauj, would be a विद्वद्बन्धु and befriend a learned man like himself, that he would be a गुणेषु विशेषवित् and appreciate the special merit of his own work, which was evidently composed to rouse the martial spirit of his countrymen. Kannauj we know was then laid low at the feet of enemies, and the patriotic Bhatta wished that the Pāñcālas should rise against their enemies, and make an effort to regain their freedom. He was, however, disappointed in his hopes and when he came to a foreign country to seek that royal patronage which was denied to him in his own, he pathetically exclaimed कालाकालप्रभावित अस्मिन्नेव राजहंसा गताः &c[1]

Many MSS of the drama end with the verse सततप्रणतो भूयाद् भूपः प्रसादितमत्सरः॥ I think the drama as originally composed, ended here but in the MSS current in Bengal we have the following additional verse

अपि च,

अवनिमवनिपालाः पान्तु वृष्टिं विधत्तां
जगति जलधरालौ शस्यपूर्णास्तु भूमिः।
त्वयि मुरनरकारौ भक्तिरद्वैतयोगाद्
भवतु मम सुदीर्घं वक्षमभ्यन्तु देवाः॥

It is a remarkable fact that in the MSS current in Western India this verse is wanting

Now the words at the beginning of this verse seem distinctly to refer to the Pālas We know that the Pālas were frequently called भूपाल, क्ष्मापाल, or अवनिपाल The dynasty being called भूपालवंश the founder of it गोपाल even came to be called भूपाल by many authors In the copper-plate itself Dayita Visnu, the progenitor of the family, is called प्रकृतिरवनिपालानां The words अवनिमवनिपालाः पान्तु therefore, seem to mean "May the Pāla princes continue to rule over this earth," otherwise if we understand by the words "May *kings* rule over the earth" the meaning would be most trivial. I am of opinion that this very interesting verse, the full meaning of which now dawns upon us for the first time, was composed after the poet settled in Bengal It was, in fact, his benediction to the Pāla king who bestowed on him the four villages

And as to the grant of the four villages there is a very significant passage in the drama Thus, in the first act, in the message of peace of which Krsna was the bearer, Yudhistira thus addresses the Kaurava monarch—

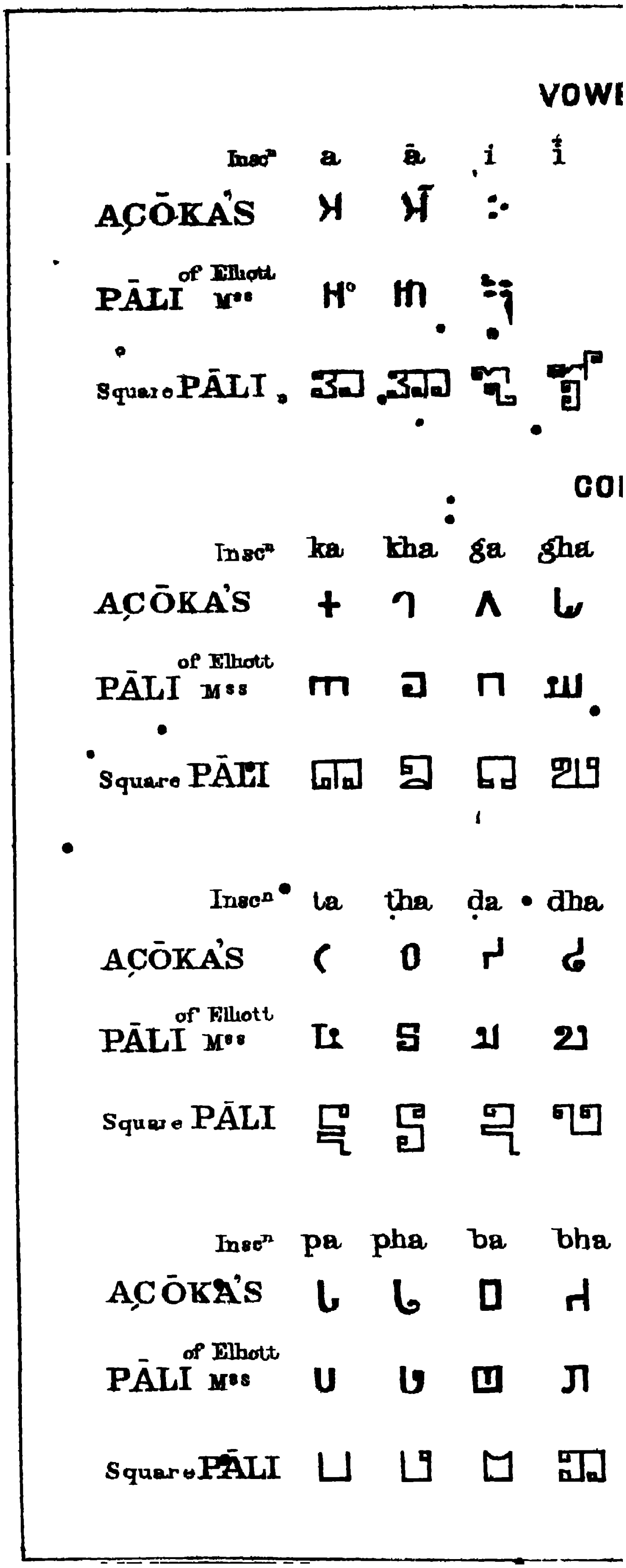
इन्द्रप्रस्थं वकप्रस्थं जयन्तं वारणावतम् ।
देहि मे चतुरो ग्रामान् पञ्चमं किञ्चिदेव तु ॥

Now, when the drama was acted in Bengal, it was this characteristic passage which, it seems to me, suggested the grant of four villages to the poet देहि मे चतुरो ग्रामान् was interpreted by the patrons of the poet as the expression of his own desire And, what is also very striking,—

we find that among the villages granted to the poet the very first village is called **क्रौञ्चश्वभ्र** which sounds much like **बकश्वभ्र, क्रौञ्च** and **बक** meaning the same thing.

Nārāyana Bhaṭṭāraka in the copper-plate cannot from the adjectives attached to it mean the God Nārāyana. It plainly refers to some person whose name was Nārāyaṇa, who was deemed a holy man, and who had come as a guest to the Lāṭa Brāhmaṇas. Everything therefore points to the identity of Nārāyana Bhaṭṭāraka with Bhaṭṭa Nārāyana, the author of the Vēnī Saṃhāra

I am aware that some think Lāṭa to have been in Gujarāt In Dr. Buhler's article on Inscriptions from Kāvī, see *Indian Antiquary*, V, p 145, we read that the Rāṣṭrakūṭa prince Govinda II made over the Lāṭēçvara Mandala to his brother Indra. Govinda II seems to have been a conqueror, and he seems to have led a Rāṣṭrakūṭa invasion of Gujarāt. That need not make us think that Lāṭa was in Gujarāt The Lāṭēçvara Mandala above referred to, was probably the kingdom of Kannauj itself: and Indra who received the Lāṭēçvara Mandala from Govinda II, was probably the very Indra Rāja whom Dharma Pāla conquered, according to the copper-plate of Nārāyaṇa Pāla.—Govinda II was alive in Çāka 730 = 808 A D., and was thus a contemporary of Dharma Pāla I am strongly inclined to think that the Lāṭa Brāhmanas to whom Bhaṭṭa Nārāyana came were really Kannauj Brahmanas



VOWE

Inscn a ā i ī

AÇŌKA'S

PĀLI of Elliott Mss

Square PĀLI

CON

Inscn ka kha ga gha

AÇŌKA'S

PĀLI of Elliott Mss

Square PĀLI

Inscn ṭa ṭha ḍa ḍha

AÇŌKA'S

PĀLI of Elliott Mss

Square PĀLI

Inscn pa pha ba bha

AÇŌKA'S

PĀLI of Elliott Mss

Square PĀLI

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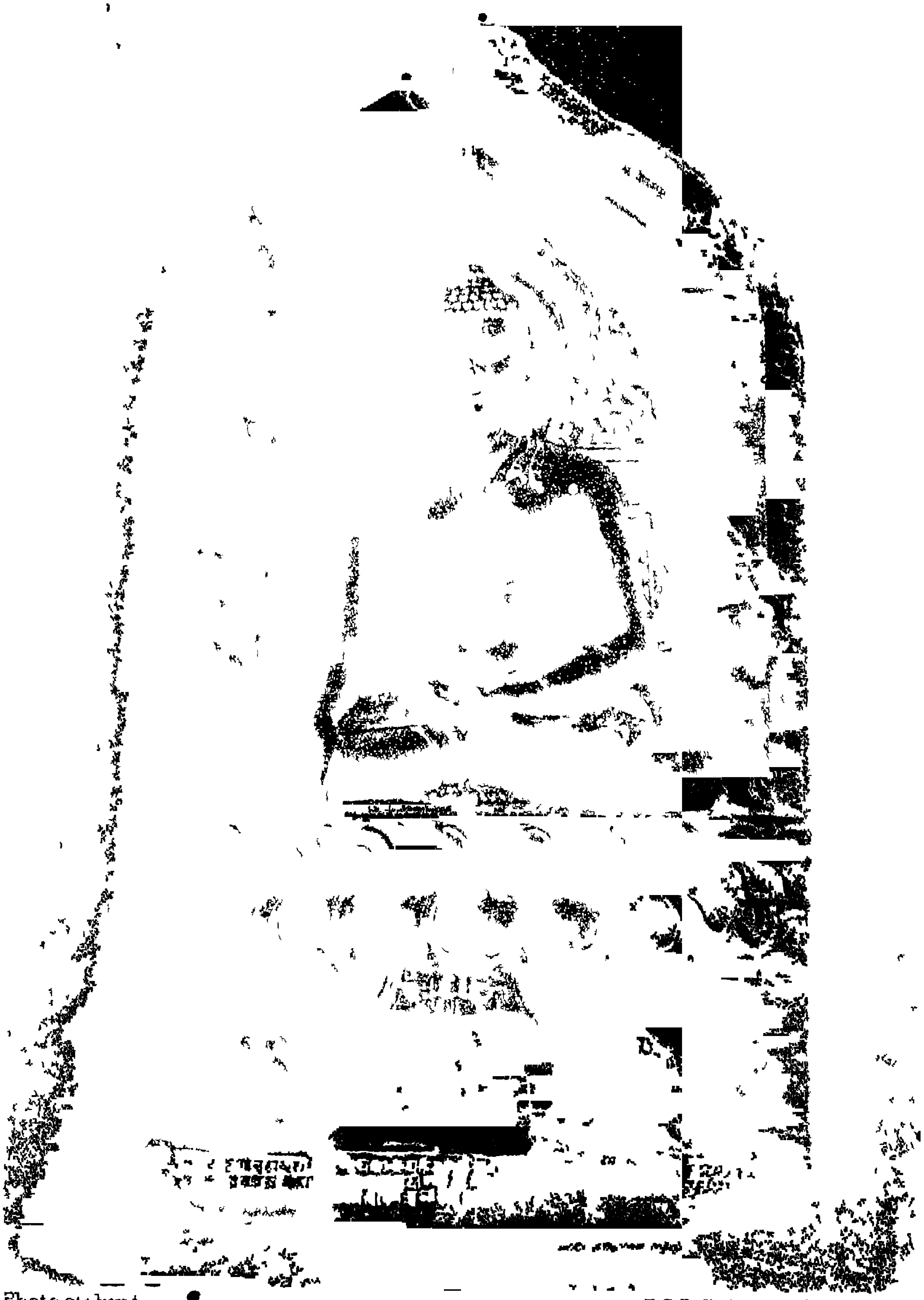


Photo etching

S I O Calcutta March 1894

SEATED BUDDHA FOUND NEAR RAJGIR

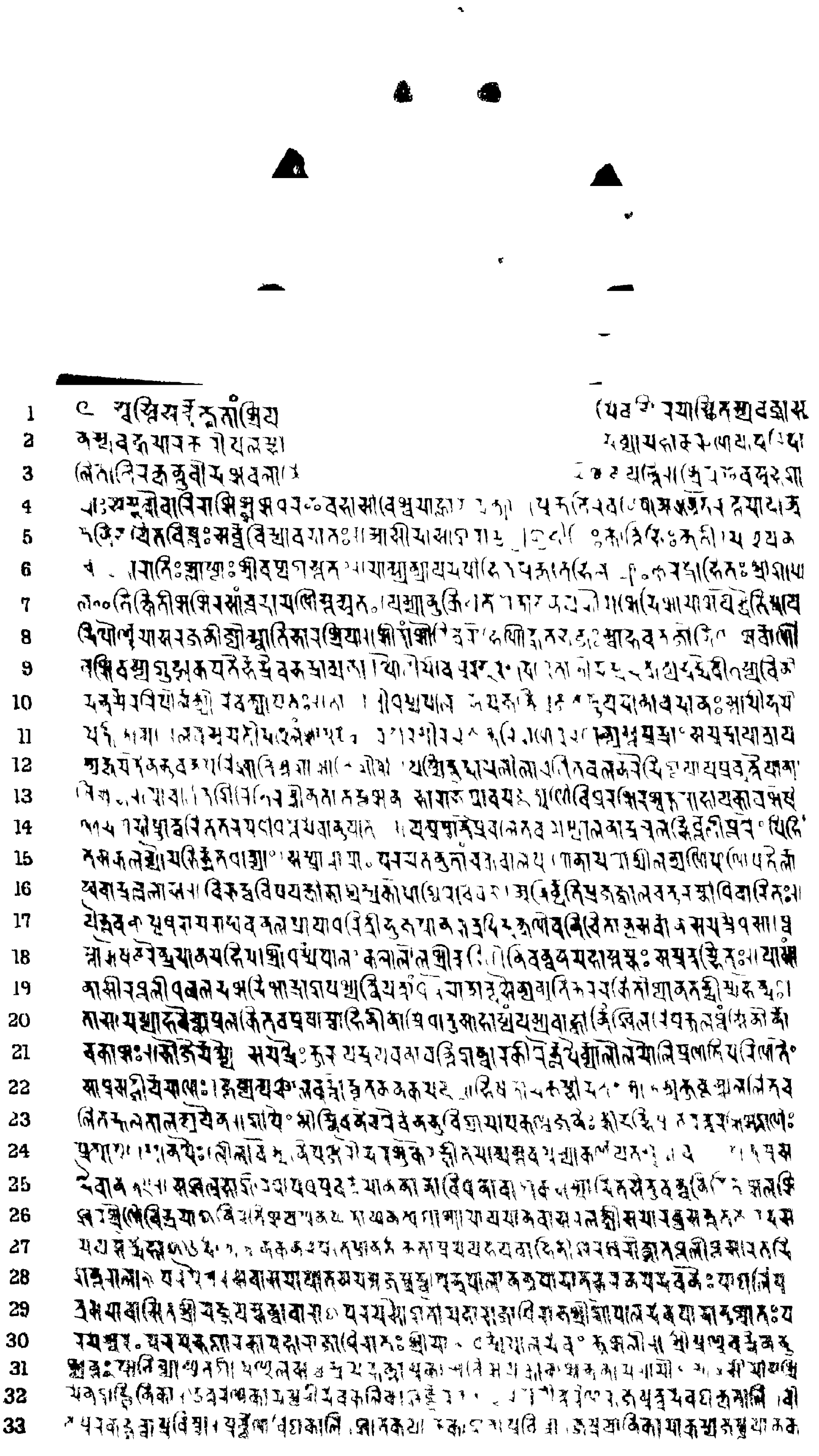
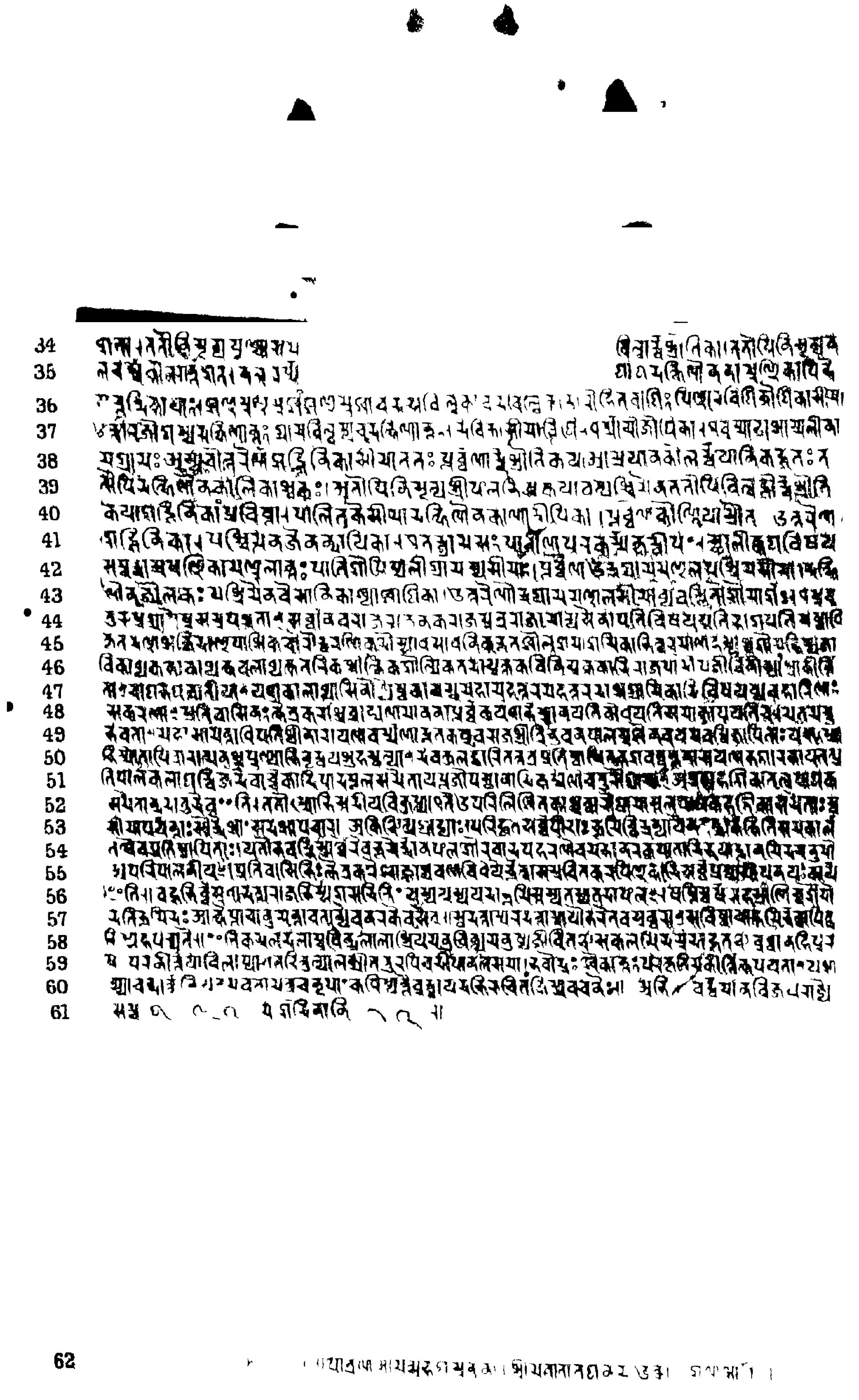


Photo-etching

COPPER-PLATE

PLATE III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Survey of India Offices Calcutta June 1894

OF DHARMAPĀLA

-third)

Under orders of the Council the following system of transliteration will be adopted for the future in all publications of the Society. Authors of papers for the *Journal*, Pt. I, are particularly requested to adhere to it in their contributions.

A. FOR THE DÊVANĀGARĪ ALPHABET, AND FOR ALL ALPHABETS RELATED TO IT

अ *a*, आ *ā*, इ *i*, ई *ī*, उ *u*, ऊ *ū*, ऋ *ṛ*, ॠ *ṝ*, ऌ *ḷ*, ऎ *e*, ए *ē*,
ऒ *o*, ओ *ō*, ऐ *ai*, औ *au*, ˙ *ṁ*, ˘ ~ ः *ḥ*
क *k*, ख *kh*, ग *g*, घ *gh*, ङ *ṅ*
च *c*, छ *ch*, ज *j*, झ *jh*, ञ *ñ*
ट *ṭ*, ठ *ṭh*, ड *ḍ*, ढ *ḍh*, ण *ṇ*
त *t*, थ *th*, द *d*. ध *dh*, न *n*
प *p*, फ *ph*, ब *b*, भ *bh*, म *m*
य *y*, र *r*, ल *l*, व *v*, (ळ *ḷ*)
श *ç*, ष *ṣ*, स *s*, ह *h*

In the above the *virāma* has been omitted for the sake of clearness

* In Modern Vernaculars only; ड़ may be represented by *ṛ*, and ढ़ by *ṛh*.

Avagraha is to be represented by an apostrophe, thus सोऽपि *sō 'pi*. *Visarga* is represented by *ḥ*, *Jihvāmūlīya* by *ẖ*, and *Upadhmānīya* by *ḫ*. *Anusvāra* is represented by *ṁ*, thus संसर्ग *saṁsarga*, and *anunāsika* by the sign ˜ over the letter nasalized, thus अँ *ã*, आँ *ā̃*, and so on. The *udātta* accent is represented by the sign ʹ and the *svarita* by ˆ. Thus, अग्निः *agníḥ*, जनिता *janitá*, क्व *kvâ*, कन्या *kanyâ*. The *anudātta* accent may be represented by ˋ. Thus, ते ऽवर्धन्त *tè àvardhanta*

B. FOR PERSIAN (INCLUDING ARABIC WORDS IN PERSIAN) AND HINDŪSTĀNĪ.

(*The system is not applicable to Arabic when pronounced as in Arabic-speaking countries*) :—

Vowels.		Consonants.		Sounds only found in Hindūstānī	
ا	a	ب	b	بھ	bh
آ	ā	پ	p	پھ	ph
اِ	i	ت	t	تھ	th
اِی	ī			ٹ	ṭ
اے	ē			ٹھ	ṭh
اُ	u	ث	ṣ		
اُو	ū	ج	j	جھ	jh
او	ō	چ	c	چھ	ch

Vowels.		Consonants		Sounds only found in Hindūstānī.	
اَی	ai	ح	h		
اَو	au	خ	kh		
		د	d	دھ	dh
				ڈ	d
				ڈھ	ḍh
		ذ	z		
		ر	r	ڑ	ṛ
				ڑھ	ṛh
		ز	z		
		ژ	zh		
		س	s		
		ش	sh		
		ص	s		
		ض	z		
		ط	t		
		ظ	z		
		غ	gh		
		ف	f		
		ق	q		
		ک	k	کھ	kh
		گ	g	گھ	gh
		ل	l		
		م	m		
		ن	n		
		ں	when representing *anunāsika* in Dēva Nāgarī, by ˜ on the preceding vowel		
		و	w (or rarely v)		
		ه	h		
		ی	y		
	Hamzah	ء	(where necessary) ’		

The ل of the article ال in Arabic words should be assimilated before the solar letters, and the vowel *u* which often precedes the article and absorbs its vowel should remain attached to the word to which it belongs Thus— اقبال الدولة Iqbālu-d-daulah.

Tanwīn may be rendered by n—e. g , *ittifāqan* *Alif-i maqṣūrah* should be rendered by *ā*.

Final ة need not be written in Persian and Hindūstānī words, but should be written in Arabic words.

Coins Supplementary to Thomas' Chronicles of the Pathan Kings of Dehli, No. V.—By C J RODGERS, *Honorary Numismatist to the Government of India.*

(With Plates IV and V)

I began drawing the coins in the accompanying plates when on a visit to Sir Alexander Cunningham, at Simla, in 1885 During the time I was Archæological Surveyor, I had but little leisure for drawing coins, though I came across many novelties in my tours and saw many in the collection made by the Afghan Boundary Commission. Since the Archæological Survey was closed, my time has been fully taken up with work on coin catalogues. In this work, I again saw many coins new to numismatics, but they did not often belong to the period or the portion of the empire treated of in Mr. Thomas' "Chronicles." Sometimes I came across coins accidentally, and sometimes while making a catalogue of the coins I had previously collected and had afterwards sold to the Panjāb Government, I discovered that there were coins to which I had not previously paid sufficient attention Meanwhile some of the coins I had drawn were edited, but not in the *Journal* of the Asiatic Society of Bengal. The last coin I drew was finished in the last week of March 1894.

The coins in the plates are without arrangement. They were drawn as they came under my notice.

This is the last supplement I shall be able to give to Mr Thomas' excellent work There are, I know, many coins now known which were not known to Mr. Thomas and which I have seen but not noted. For example, the copper coins of the Sūrī Islām S͟hāh, with mint names on them, are now somewhat numerous, but they have not been edited Again the many varieties of the coins of 'Alāu-d-dīn of K͟hwārizm have not been drawn. It is a pleasure to me, however, to know that all these coins are in the museums of India They will give employment to future numismatists.

It must not be supposed that our knowledge of the coins of the kings who ruled over India for about 300 years before the time of

Bābar is complete. It is far from being so. There are coin stores in India which have never been examined. There are many bāzārs which have never been visited once by any numismatist. New small finds are constantly being made, and are finding their way into the bāzārs. I never make a visit to any town without getting some novelties. It is my conviction that were the bāzārs of all the towns of Northern India to be carefully examined, a vast number of coins hitherto unknown might be obtained. In Amritsar the other day, I found a coin of Humāyūn's struck at Champānīr. It had on it, however, the singular legend فتح چپانیر ۹۴۲ "The conquest of Champānīr, 942" Again in the same city, I lately obtained a mohur of Ḥasan Shāh ibn Ḥaidar Shāh of Kashmīr, dated 876 H. This is as yet unique Coin No. 19 of the present supplement is another case in point. It was purchased by me in the bāzār at Sōnpat The beautiful coin No 36 was given me as a medical fee by a coin dealer in Dehlī, although all I told the man was to send his son at once to an eye-hospital.

Uncatalogued collections pay for being examined I had had coins Nos 37–40 for many years It was only when I examined each coin with a view to describing it accurately, that I discovered what they were. Since I drew No. 4 I have come across another type of the coins of Nāṣiru-d-dīn Khusrau Shāh in the collection of an amateur It is the smallest type and has on it, on the obverse خسرو شاه, and on the reverse حضرت دهلي Again of the coins of Nasrat Shāh I have lately discovered a new type. It is one weighing 138 grs, but has on it only نصرت شاه سلطان and دارالملک دهلي It is double the weight of the coins on which these legends usually occur

It is quite true that old coins are being bought up with avidity, and that many are annually being taken or sent out of the country, but nevertheless, annually, many novelties are coming to light. All that is wanted is that some one who knows what they are, should be appointed to go round and collect them Then our museums would annually be enriched with many treasures This means, however, that the museums should have an annual grant made to them for coin purchases I cannot conceive of public money being better spent, for all museum collections are for the use of the public

I proceed to describe the coins drawn in the accompanying plates IV and V. Their metal and weights are shown on the plates. Each coin is drawn equal to its actual size.

PLATE IV—

(1) Obv السلطان الا Rev. Horseman to right.
عظم غیاث الدنیا
و الدین

This coin was in the collection of the late Sir Alexander Cunningham. It is the last coin on which the horseman appears. I ascribe it to G͟hiyāṣu-d-dīn Balban.

(2) Obv. In six foil :—	Rev. In six foil
سلطاني	خليفه
فيروز	ابو الفتح

(3) Obv. In square, inscribed in a circle :—	Rev. In square, inscribed in a circle :—
السلطان	عبده
الشهيد	الملک

This is a coin of Yalduz with Mu'izzu-d-dīn as the Martyr-sultān. Nos. 2 and 3 were also in the cabinet of Sir Alexander Cunningham.

(4) Obv السلطان الا	Rev. خسرو
عظم ناصر الدنيا	شاه السلطان
والدين ابو	ولي امير المو
المظفر	منين ۷۲۰

This is from my own cabinet. It is a new type of Nāṣiru-d-dīn K͟husrau S͟hāh

(5) Obv. سلطانے	Rev. المومنين
تغلق شاه	نائب امير
A new coin of Tug͟hlaq S͟hāh II, 790 H.	۷۹۰

(6) Obv نصرت شاه	Rev. المومنين
ے	نائب امير
سلطا	

(7) Obv. شـــاه	Rev
شيـــر	The Kalima
السلطان خلد	....
الله ملكه (۹)۴۹	

Probably " S͟hēr S͟hāhī" in Hindī

(8) Obv. سيف	Rev. Horseman to left.
الملک	
الاعظم	
ابو المظفر	
محمد بن سام	

(9) Obv. In circle:—	Rev. عبده
السلطان	الملک المعظم
الشهيد محمد	سلطان الشرق تاج
ابن سام	الدنيا و الدين
غزنة في شهور سنة احدي عشر و ستمائة	(يلدز) السلطان
(Ghaznih, 611 Ḥ.)	

This is again a coin of Yalduz with his master's name and his own on it.

(10) Obv. الملك المعظم	Rev In a square inscribed in a circle —
ناصر الدنيا و الدين	
ابو المظفر محمد بن	The Kalima
ابوالفتح	Margin — في محرم سنة

Nos 7, 8, 9, 10 were in the cabinet of Sir Alexander Cunningham No 10 he assigned to Nāṣiru-d-dīn Muhammad Qarlugh.

(11) Obv. In a square —	Rev In a square —
السلطان الاعظم	في عهد الامام
شمس الدنيا والدين السلطان	المستنصر امير المومنين
المعظم ركن الدنيا و الدين	في شهور سنة ثلث
فيروز شاه	و ثلثين و ستمائة
	Above in margin دهلي

This is from the same cabinet as No 10. It is peculiar. It has the name of father and son on the obverse On the reverse only the name of the mint *Dehlī* is in the margin. The year comes along with the name of the Khalīfah in the square area. This is a unique arrangement. The whole coin indeed is unique.

(12) Obv. In a circle —	Rev In a circle —
السلطان الاعظم	الامام
معز الدنيا و الدين	المستعصم امير
ابوالمظفر كيقباد	المومنين
	Margin — ضرب دهلي في سنة .. ثمان ثمانين و ستمائة السلطان
Traces of margin	(Dehlī, 688 Ḥ.)

Thomas gives no mohur of Kaiqubād This one is in the cabinet of L. White King, Esq. Others are known

(13) Obv. الواثق بتائيد	Rev. في زمن الامام
الرحماني نصرت شاه	امير المومنين
سلطاني خلد	خلدت خلافته
ملكه	٨٠٠

This is from my own cabinet. It is now in the Lahore Museum.

	Obv.	Rev.
(14)	محمد شاه	خلدت
	فريـــد شاه	المومنين
	خضر شاه	٨٤٢
	(ضرب) حضرت دهلي	امير
	(Dehlī)	(842 Ḥ.)

From my own cabinet. I believe all coins of this size of Muhammad Shāh bin Farīd have the name of Khizr Shāh also on them.

	Obv. In double circle —	Rev.
(15)	محمد تغلق	الراجي
		الرحمه الله
	Traces of margin.	الكريم

This new type of Muḥammad Tughlaq's coin was discovered by me on one of my tours

	Obv. In a rayed circle.—	Rev. Over a bull some of the letters of *Çrī Sāmanta* in Hindī
(16)	تاجي	

I ascribe this coin to Tāju-d-dīn Yalduz, تاجي forms from تاج just as معزي and شمسي from معز and شمس This new coin is from my cabinet.

	Obv. In a rayed circle —	Rev Standing bull and over it
(17)	رضية inverted as in type.	*Çrī Sāmanta Dēva* in Hindī

I was the first to bring to notice coins of Razia with her name رضية in a rayed circle. This second type of the same coin I also discovered.

Plate V—

	Obv.	Rev
(18)	السلطان الا عظم	في زمن الامام
	عباث الدنيا و الدين	امير المومنين
	تغلق شاه	ابي عبد الله
	سلطاني	خلدت خلافته
		In margin...... ... .دهلي . . ...
		The margin reads from outside.

This unique mohur of Tughluq II, was sent to me by Dr. Hoernle * The Khalīfah's name being عبد الله assigns it to Tughlaq Shāh II.

	Obv	Rev.
(19)	السلطان الاعظم	السلطان المعظم
	غياث الدنيا و الدين	ناصر الدنيا و الدين
	ابو المظفر تغلق شاه	ابو المظفر ابراهيم شاه
	السلطان	السلطان ابن السلطان

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* [It belonged to the Hōshangābād find; see *Proceedings, A. S. B*, for December, 1888. It is described and figured in Dr Hoernle's paper "On some new or rare Muhammadan and Hindū Coins," *ante*, Vol. LVIII, p. 31, and pl. IV, fig. 2. It is now in the British Museum.—Ed.]

This unique coin, which is now in the British Museum, was obtained by me at Sōnpat, near Dehlī, in my third archæological tour together with a hemi-drachma of Agathokleia. It was struck in Bengal. It has on it the name of Tughlaq Shāh I of Dehlī, and of the Nāṣiru-d-dīn whom he conquered in Bengal From this coin we learn that his name was Ibrāhīm Shāh. This is not recorded in any history to which I have had access. Unfortunately neither side has room for a margin.

(20) Obv غياث Rev. السلطان
شاه السلطان ابن السلطان
الخلجي (٨)٦٦ ولي عهد

I have not met with any other coin of this type It seems to reveal to us the fact that Ghiyās Shāh Khiljī struck coins in the reign of his father. 866 is 14 years before the time of his father's death and his own accession The use of the term *Walī'ahd*, or heir, is common on such occasions

(21) Obv السلطان Rev ناصر الدنيا
المعظم و الدين

This beautiful silver anna of Nāṣiru-d-dīn Mahmūd is the second one I have discovered. I have one in my fourth Supplement I gave a silver anna of Ghiyāsu-d-dīn Balban in the third Supplement I believe these three are the only ones known

(22) Obv في زمان الامام Rev In double circle —
المستكفي بالله امير المومنين ابو الربيع و الله
سليمان خلد الله خلافته الغني و انتم
الفقرا

This mohur seems to have been struck from odd dies. The obverse is the same as the reverse of the mohur No 328 of the B M. Catalogue, and the reverse is the same as the obverse of No. 276 of the same catalogue

(23) Obv سيف Rev. In a circle —لا اله الا الله
الدنيا و الدين محمد رسول الله
ابو المظفر حسن الظاهر بامر الله
قرلغ امير المومنين
Margin —ثلث

This unique rupee is in the cabinet of General M. Gossett, C.B It has two peculiarities On the obverse instead of الحسن is حسن only. On the reverse the Khalīfah's name is الظاهر who was Khalīfah from Ramẓān 622 to Rajab 623 Ḥ. As in the margin we have the unit figure ثلث-3, we may conclude that this coin was struck in 623 Ḥ. This is the only known coin on which the name of the Khalīfah is found.

This fact speaks well for the communications between India and Baghdād.

(24) Obv. شمس (الدنیا)
و الدین
السلطان

Parts of a horseman to right.

This is a new type of Shamsu-d-dīn Iltimish.

(25) Obv.	Rev.
عدل	عدل
السلطان	السلطان
Six-rayed star.	Six-rayed star.

I assign this to Shamsu-d-dīn Iltimish.

(26) Obv.	Rev.
شمس	Horse to right
الدنیا و الدین	Instead of horseman a six-rayed
التمش	star or sun
السلطان	Above, remains of Hindī letters

Nos 24, 25 and 26 are from my cabinet.

(27) Obv. In a circle —
السلطان
الا عظم ابو
الفتح محمود
بن محمد بن سام

Rev. An elephant to left

This coin I ascribe to Mahmūd, son of Ghiyāṣu-d-dīn Muhammad bin Sām.

(28) Obv In double square, inscribed in a circle —	Rev In double square, inscribed in a circle—
لا اله الا الله	الناصر لدین الله
محمد رسول الله	السلطان المعظم
السلطان الا عظم	معز الدنیا و
غیاث الدنیا و الدین	الدین ابو المظفر
ابو الفتح محمد بن سام	محمد بن سام
Margin —	Margin —
هو الذي ارسل رسوله &c.	ضرب هذا الدینار في شهور سنه تسع و تسعین و خسمایه

This beautiful gold coin, bearing the names of Ghiyāsu-d-dīn and Mu‘izzu-ḍ-dīn, is from the Boundary Commission collection, as is No. 27

(29) Obv. In a circle —

السلطان
الاعظم غيا
ث الدنيا و الدين
ابو الفتح محمو
د بن محمد سام

Rev. In a circle —
An elephant to left.

(30) Obv. In hexagon made by two equilateral triangles intersecting each other —

محمد بن
سام

Rev. In hexagon as on obv.

ابو (الفتح)

Nos 29 and 30 are assigned to the same as No. 27.

(31) Obv

ابو بكر
بن ظفر بن فيروز شاه *
سلطانے حضرت دهلي

Rev

الخليفه
عبد الله خلد
خلافته ٧٩١

On this coin of Abū Bakr's we have the mint "Dehlī" plain The mint is on no other known coin of this king.

(32) Obv

دهلي
السلطان
الاعظم معز
الدنيا و الدين

Rev
Horseman to right.
Above him, بهرام شاه

This small coin of Mu'izzu-d-dīn Bahrām Shāh is unique

(33) Obv

تغلق (شاه)
سلطانے ضرب
بحضرت دهلي

Rev.

لخليفه
امير المومنين
خلد خلافته

This is a new type of the copper coins of Tughlaq II.

(34) Obv.

(ابو المظفر)
ابراهيم (شاه)
سكندر (شاه)
السلطان

Rev.

امير المومنين
خلد خلافته ٩٢٦

Dated coins of Ibrāhīm Lodī, over 80 grs in weight, are extremely rare.

(35) Obv In hexagon made by two interlacing equilateral triangles —

شاه
فيروز

In an octagon —

بحضرت
دهلي

These small coins of Fīrōz Shāh have generally عدل above the obverse. Here it is omitted. It is a coin of Jalālu-d-dīn Fīrōz Shāh.

(36) Obv In a circle — Rev A knot

الله الكافي الخليفه المستكفى

A knot. A knot.

This beautiful coin of Muhammad Tughlaq's was found by me at Dehlī It is now in the British Museum

(37, 38, 39, 40) Obv. In a rayed circle or rayed area — Rev Bull and remains of Hindī letters.

قطبي

These coins I ascribe to Qutbu-d-dīn Aibak, but with some diffidence. قطبي forms from قطب as معزي from معز, شمسى from شمس, and تاجى from تاج If I am correct, then these four coins are the only ones of Qutbu-d-dīn Aibak known. They were all in the cabinet I sold to the Panjāb Government two years ago I did not myself know of their existence, till I was compelled to examine each coin carefully for the purpose of entering it in the Catalogue These coins are all from different dies they are now in the Lahore Museum

Catalogues of the coins in the Lahore Museum, the Indian Museum, and the Museum of the Asiatic Society are now in different stages of progress When they are completed, we shall see what coins are in these museums From what we know at present, the coins of India itself are but poorly represented, while the coins of Asia, of Central, and Western Asia, the very cradles of mankind and of civilization and the fountains of all Indian History, are but very imperfectly shown. The truth is that we are only beginning to find out what vast fields of history are capable of being illustrated by coins Coins, however, being themselves intrinsically valuable, money is required at every stage of the enquiry Unfortunately, one of the most enthusiastic of our collectors and one who possesses extensive knowledge about everything that has hitherto been obtained, is an excessively poor man, and he often has to pass by, to let slip out of his hands, precious and new coins, simply because he has not the means wherewith to purchase them. This should not be the case

Just lately, the collections of Dr Stulpnagel, late Principal of the Lahore Government College, of Thomas Higgens, Esq, Pleader, Lahore, and of Eugene Leggett, Esq, of Kurrachee, have been dispersed They all contained precious and unique things The first collection has gone to Chicago, where it is a wonder, and nothing more, the second and third collections are simply scattered, but not one coin has gone to any Indian Museum The collection of the late Pandit Ratan Narain, of Delhi, was full of unique coins, chiefly of the Sultans of Delhi It has gone whole to America The vast collection of Dr Da Cunha, of Bombay was sold by Sotheby in London No coins, therefore, out of both these came to any Indian Museum There is now in the market, the collection of General Gossett, which has many unique coins in it, and some which though not unique are very rare This will, we fear, share the same fate as the others Now, the British Museum secured some of Dr Da Cunha's coins That institution has an annual grant made to it for the sole purchase of coins Hence, when coins are sold which they are in want of, they can always get specimens of them But it is not so in India I would ask to be allowed to plead for our museums on behalf of their coin collections I would ask those native gentlemen who are interested in the future of their own land, to come forward and assist in putting our museums on a sound financial footing Money cannot be better spent than by bestowing it in grants to the Trustees of Museums for the purchase of objects of interest We have now well-educated natives of India who are also rich men It is to them we must look for the future prosperity of our museums Many of these gentlemen are members of different learned societies. They would, I feel sure, if asked, take a prominent part in the management of our museums This seems one of the objects we should aim at Englishmen are always coming and going India is not our home It is for those to whom India is a home, to adorn that home with the relics of bygone days, and from no series of relics can so much information be obtained as from coins

Notes on early local silver coinages in North-Western India and in the Konkan—*By* W THEOBALD, *Member of the Num. Soc Lon, and Royal As Soc*

[Read December, 1893]

Among the few articles recovered from the wreck of the steamer wherein the Archæological treasures, books, and manuscripts of Gen Sir Alexander Cunningham were lost beneath the waters of the Bay of Bengal, were some bags of coins, which the owner obligingly presented to me, in the hope that some of the coins might be so cleaned from the crust which had overspread them during their submergence in the sea, as still to be of value and this proved to be the case with many specimens, though a large number were too corroded by the water to be worth keeping. The majority of the coins, which amounted to several pounds in weight, were of copper, or that mixture of silver and copper issued by the Dehlī mint, but among them were a few silver coins, which I propose to describe in the present paper These silver coins numbered eighteen in all, of which number sixteen may be referred to a type of great antiquity and intermediate in character between the well-known 'punch-marked' coins and those of later date impressed by a single 'die' The coins are impressed from a single die, and thereby connected with modern coinage, but from the simplicity of design, the character of some of the symbols on them, and above all, by their weight, they are evidently closely related to punch-marked coins, and form as it were a local coinage, *sui generis*, which, as far as is at present known, was confined to the North-West of India, or to speak more particularly, to the neighbourhood of Mathurā. Collectively speaking, these sixteen coins may be referred to one class, but thirteen of them have the reverse, either blank, or with two or three small 'punch' marks impressed thereon, whilst three of them have the reverse also rudely and imperfectly impressed by a 'die' Of the above thirteen coins eleven are stamped on the obverse with a peculiar collection of symbols, with such slight variation as resulted from the employment of different dies, not identical in minor particulars, whilst two present an entirely different design, neither design being very clear as regards its import, or easy to describe, so as to convey any precise idea by words to the reader The coins are square or polygonal, or even partly rounded The square ones are eight millimeters broad, and three in thickness The heaviest coin weighed 27 grains, whilst the average of eleven coins is a trifle under 26 These pieces, therefore, are half *kārsāpanas*, the calculated weight of which equals sixteen *ratis*, or 28·8 grains, though coins rarely attain the full standard of weight and not unfrequently, through wear, fall much below it (See General Sir A Cunningham's *Coins of Ancient India*, p. 44)

One of the leading peculiarities of the *purānas*, or old silver *kārsāpanas*, is that no two are ever seen exactly alike, the result of course of the symbols, or devices, on them being struck independently from different 'punches' at different times With 'die'-struck coins, however, this is not so, though different dies may vary somewhat in the details of the devices on them.

The device on the obverse of eleven of the coins is made up of two principal symbols, and four or five smaller or accessory ones The first and uppermost of the two principal symbols resembles a nine-pin, placed horizontally, with its head to the right and the body slightly tapering towards the left The head is conical, and demarked from the body by a constriction, or neck, on the left of which, in some coins, is a circular impression or groove, which, were it not behind the head, might be thought to represent an eye

The lower side of the object is very slightly convex and quite plain, but above and inclined at an angle of 45° to the axis of the body are three or four parallel straight or slightly curved lines, having a rayed or fin-like character, whilst two shorter lines terminate the body and impart a fanciful fish-like appearance to the whole symbol What this symbol is intended to represent I have not the faintest idea, nor does it resemble any of the numerous symbols met with on the silver *kārsāpanas*, or 'punch-marked' coins On these 'punch-marked' coins fish are very conventionally portrayed, but there is no doubt respecting the object the artist had in view On each side of the body two fins are symmetrically arranged, the anterior pair representing the pectoral, whilst the others stand for the dorsal and ventral fins Behind the fins comes the more or less bifid tail, which leaves no doubt of the nature of the object in question See *Numismata Orientalia*, Part I, plate I, fig 10, on which a pair of fishes is seen in an 'incused' area, and in the same plate, fig 8, where a turtle is represented between two fishes, and the third figure on the right on the seventh line, where two pairs of fishes are represented in a tank facing one another In the symbol, however, on the coins I am dealing with, there is a complete want of symmetry in the fin-like rays, and above all, the marked constriction behind the head is quite conclusive that no fish is intended It has occured to me that a 'dug-out' or fishing canoe, made from the hollowed stem of a 'Borassus' palm, may be the object intended In that case the fin-like lines above would represent the supports for the net, either of bamboo or rope 'This mode of fishing, which may be still noticed on the rivers of India, is no doubt very ancient. The method adopted is to fix two long bamboos over the side of the boat, as a 'fulcrum,' so that they can be tilted downwards beneath the water and afterwards raised above it Between these bamboos a net is stretched, which by being lowered into the water by means of its supports, often captures fish which may have drifted over it This suggestion is merely hazarded for want of a better, but we may be sure the design represents some object or idea familiar enough in the daily life of those among whom these pieces circulated. Below the last symbol is another, equally puzzling at first sight, and respecting which all that can be safely said is that it is intended to represent some quadruped or other, with its head to the right hand On seven of the coins the form of the animal is sufficiently well preserved for a general description. The legs are short and merely represented in a conventional manner The head presents the only character to guide us It is destitute of horns, and therefore no bovine or other ruminant It is massive and set squarely on to the neck, the line of the back and the plane of the forehead forming an angle clearly less than a right angle There are no tusks, and it is therefore pretty certain an elephant is not intended This almost reduces our choice to the horse, and the tail which is preserved on one or two specimens quite supports this conclusion The horse does not occur (to my knowledge) on any silver 'punch-marked' coin, but occurs on the later die-struck copper coins of the Satrap Hagamasha, figured by General Sir A Cunningham among Mathurā coins (*Coins of Ancient India*, plate VIII, fig 7). In some cases, on this symbol likewise, a small punch-marked depression may be noticed, which might be supposed to represent an eye, as was noticed in the case of the first-described symbol, but these marks are produced by a 'punch,' and occur on both sides of the coin, and are most probably 'shroff marks' or marks of attestation put on coins by money-changers through whose hands they have chanced to pass This system of 'shroff marking' all 'rupees' which pass through a money-changer's hands is in fact nothing more than a survival of the earliest mode of attesting current money by impressing a 'punch-mark' thereon, though the 'punches' used by private individuals were smaller and less intricate in character than those used on the earliest coins or *kārsāpanas* The rupees of the great Kooch-Behar 'find' of 1863, were 'shroff-marked' with a variety of 'punches,' and many Bengal coins are completely defaced by the process, and I may here testify to what has often struck me in the early 'punch-marked' coins,—the wonderful capacity the engravers of these 'punches' displayed in conveying the idea of the object or animal intended, which can be identified, where only a fragment of the impression remains[1]

In fact the determination of the animal is really a question of 'heads and tails' The tail certainly resembles that of a horse, and if as much cannot be said of the head, there is no animal, whose head it more closely resembles. On the whole, the probability is that a horse is intended

Whilst on the subject of the identification of animals represented on old coins, (a subject claiming for its elucidation the knowledge of the sportsman and naturalist rather than the antiquarian and numismatist), I would make what I believe to be a correction of an opinion expressed in my paper 'On the Symbols on the Coins of Kuninda,' (*ante*, Vol LV, page 163), and repeated in my paper 'On Punch-marked Coins' (*ante*, Vol LIX, page 218), to the effect that the animal represented on coins of Amōghabhūti, king of the Kunindas, was intended for a Yak A capital figure of the animal in question is given in '*Coins of Ancient India*,' plate V, fig 2, and I now consider the animal on these coins to be a buffalo and not a Yak It was my friend Sir Alexander Cunningham who first drew my attention to the fact that the 'Yak' was an animal unknown in the region occupied by the Kunindas, that is, Kullu and Sirhind, and unlikely therefore to be selected to appear on their coins The buffalo, on the other hand, is an animal which has pastured on the banks of the Sutlej as early as the Aryan occupation, and probably earlier, and as the most important type of *pecuniary* wealth, it might well be selected, apart from mythological symbolism, to occupy the prominent position it does on the money of a pastoral and agricultural people The first writer (if I mistake not) to suggest the 'Yak,' in connection with the animal on the coins of the Kunindas, was Mr Edward Thomas, who thus describes the animal in *Journal, Royal Asiatic Society*, Vol. I, New Series, page 441. "The central figure represents the conventional form of the sacred deer of the Buddhists. The horns are fancifully curved, and the tail is imitated from that of the Himalayan Yak" I have in my above first-quoted paper disposed of the error Mr Thomas here falls into, in describing the horns as "fancifully curved" The two snakes, described as "fancifully curved," are not horns and do not form part of the animal above which they are displayed The tail is the tail of a 'bovine' ruminant, as distinguished from that of the 'cervine' ruminant, or deer, and there exists not the slightest ground for saying it is imitated from another animal than that represented on the coin Zoologically considered, there is no great reason why the figure might not be intended for a Yak, but as the 'Yak' is not an inhabitant of the country in which the coin was current, the figure is probably meant for a buffalo, which it suits better than any other animal Two silver coins and three copper coins, with the figure on them of the so-called 'deer,' are figured in the *Coins of Ancient India*, plate V, page 70 The two silver coins are beautifully distinct and fully support my contention that the animal is no 'deer' In both these coins the animal is seen in profile, with the head turned round so as to exhibit a pair of crescentic horns, and the tail moreover in both coins is long and bushy, reaching to the 'hocks' No deer whatever has either crescentic horns or a tail reaching to its 'hocks,' whereas the design is a very spirited one of a buffalo, with its head lifted up, as is the manner of the beast when in a threatening or inquisitive mood, and we may even identify the animal as pertaining to the short-horned race of the '*Arna bhainsa*,' as distinguished from the long straight-horned race of Assam and the Eastern Provinces [1]

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[1] On the Bengal coins in my own cabinet the following marks or symbols occur, placed always on the obverse of the coin 1, A watchful goose to r, that is with its head and neck upraised 2, A duck at roost to l 3, A crocodile asleep, to l 4, A peacock (?) 5, A conch shell 6, A Maltese cross 7, A 4-petalled flower 8, A 7 pointed star 9, A hollow square 10, Two dots in an oval 11, A horseshoe, or 'yōni' symbol 12, A wheel (solar) 13, A ball 14, A cross made of five dots, one being central 15, A conventional tree, perhaps the 'Tulsī' (Ocymum) 16, A dagger, 'Katār' 17, An S with open ends, like the letter S 18, A Bengali B, and 19, perhaps an N, and others too obscure to specify

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[1] There is also in the Panjāb a straight-horned race of domestic buffalo (whose horns are sometimes loose and attached to the skin only), but these are a very degenerate breed, and not the type displayed on the coin A buffalo head, however, of this type is seen on some Sassanian and Indo Sassanian coins The buffalo type cannot be mistaken, the convex forehead, knotty horns and square muzzle, and yet on a coin of Hormisdas III, it is merely described as "une tête de taureau," by Longpérier in his *Essay on Sassanian Coins*, page 59 If Mr Thomas erred in not recognising the buffalo as the animal on the coins of the Kunindas, he committed a still more serious error when describing the helmet of the king on a coin of Huvishka as defended by buffalo's horns (*Jainism*, pl II, fig 16) Accepting Mr Thomas's statement that the helmet is defended by 'horns,' yet how preposterous is the notion that buffalo's horns could be so used! A coin, identical no doubt with that before Mr Thomas is in my possession, and on it the horns are arranged with their bases joined in front, or approximating, whilst the

I will now describe a coin in my possession whereon the animal usually termed a deer is unusually well seen, and because the coin is of a novel and rare type and a distinct variety of that figured in *Coins of Ancient India*, pl. V, fig. 4. The coin figured (l. c.) is thus described by General Sir A. Cunningham —"Weight 131 grains. Obverse: the god Çiva standing to front, with battle-axe-trident in right hand, and leopard-skin hanging from left arm. Indian legend *Bhāgavatō Chatrēçvara Mahātanā*. Reverse: deer in middle, with symbol between horns, snake below to right, tree, star and vase to left, chaitya and symbols."

My own coin weighs 261 grains and may be described thus:—Obverse: the god Çiva standing to front, with battle-axe trident in right hand, and the left hand resting akimbo on the left hip. A sort of bow or loop below left wrist, but apparently no skin of an animal over the arm; a small crescent on the forehead, above and behind which spreads a mass of thick short curls. Body naked to the waist, loins girt with a capacious *dhōtī*, loose folds from which fall down almost to the knees. Above the left shoulder a six-rayed star identical with that ofen seen behind the figure on the reverse of coins of Aspa Varma. (*Brit. Mus. Catalogue of Greek and Scythic Kings*, pl. XX, fig. 2). All that remains of the legend is *Bhāgavatō*, as in the above coin. Reverse: a buffalo in the field, in side profile to the left, with very convex (bubaline) forehead, a bushy tail reaching to the hocks, and a single crescentic horn, from the base of which the ear is seen to protrude. Over the head an upright staff separating two serpentine bodies intended probably for a pair of cobras. On the silver coins figured on plate V (l. c.), figs. 1 and 2, the snakes are well seen, but the central staff or lingam symbol is absent. Above the muzzle of the buffalo are three balls, the obvious symbol of the masculine triad whether viewed in a sexual or theistic sense. In front of the buffalo's chest is a 'stūpa,' or 'chaitya' of six chambers, surmounted by a small T, the equivalent of the 'Chatra,' or umbrella, seen on the punch-marked coins, and representing perhaps the form taken by that symbol when wrought in stone, as seen in Burma at the present day. Below the 'stūpa' occurs the 'food receptacle' as I interpret its import (see *ante*, Vol. LIX, pl. IX, fig. 119), and at the bottom of the field a snake, with its head elevated a little from

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points of the horns project behind the king's helmet, just clear of his head. [*] Of course the horns which thus encircle the helmet cannot be those of a buffalo, being relatively too small, but are most indubitably those of the ravine deer (*Gazella bennettii*) which measure some ten inches in length, and are, by their size and shape, very well adapted for such a defensive purpose, as well as being ornamental likewise.

the ground, and in the act of progressing to the right Beneath the belly of the buffalo is a curved object like a crooked cucumber, with a T above it Behind the buffalo is the sacred tree standing on a square base, and above the animal's back an unfamiliar symbol, which has much the appearance of a monogram. It consists of the Greek letter 'phi' with the top limb removed, and standing on a short cross-bar for a base, with a similar bar attached like a semaphore arm, on the left, a little above the base A beaded margin surrounds the coin

To return now to the consideration of the half *kārsāpanas* from Mathura, there are, besides the two very obscure principal symbols, several subordinate ones of smaller size On five coins the 'triskelis' occurs in the upper right-hand corner, a little above and in front of the fish-like symbol previously described This 'triskelis' is small, very neatly formed and revolving from right to left (see *ante*, Vol LIX, pl X, fig 131). This form of the 'triskelis' forms part of the obverse die from which the coin has been struck, and stands in relief above the surface of the field; but on one coin, a small reversed 'triskelis' (see l c, fig 130) has been impressed by a 'punch,' on the reverse of the coin, and may perhaps be regarded as a 'shroff mark' put on to it after it was in circulation

Another very obscure symbol is of occasional occurrence It represents a straight object tapering to a point above, and ending below in a short lateral arm also pointed, which forms an obtuse angle with the body of the symbol This side arm is deflected either to the right or left, and the only suggestion I can offer as to its meaning is, that the symbol is intended to represent a rude wooden plough, the short basal arm being the 'coulter' Ploughs of this character, with only a few inches of iron, to form the point of the 'share' are still used in India, and the simplest form perhaps of the instrument was a straight piece of some tough wood, with a bend at one end, where a branch had been given off, to form the 'share,' such as the Poet must have had in view when attributing agriculture to the Silver Age of the Earth, and before the use of iron had come in vogue

> "Semina tum primum longis cerealia sulcis
> Obruta sunt, pressique jugo gemuere juvenci—
> *Ovid Met Lib* I, 123

Another symbol on these coins is the 'taurine' (*Journal, Asiatic Society, Bengal,* 1890, Pl X, fig 128). On four coins a pair of 'taurines,' one inverted over the other, occupies the place of the 'triskelis,' in front of the principal symbol on the right of the coin, and on a fifth coin, in addition to the 'triskelis,' a 'taurine' is added under the head (if we may so consider it) of the lower of the two principal symbols.

Lastly, on two coins, traces are seen of a 'caitya,' whereon the horse (if this attribution is correct) is standing, but which from the small size of the coin, has fallen outside its area, if this be so, coins may yet be discovered to clear up this point. The reverse of all these thirteen coins is blank, but on three of them a punch-mark, or shroff-mark as I consider it, has been stamped, a 'triskelis' a 'taurine,' (?) or circle, a mark like the letter R, the upright limb being shorter than the oblique one, and two short parallel strokes or bars.

Adverting now to the three coins whereon an impression has been made by a reverse die, the ninepin-like symbol occurs on the obverse of all of them, only rather more fish-like than usual. On one of them the lower symbol may be fairly construed to represent a horse with a flowing tail, on another the design is too blurred for recognition, whilst on the third the animal may be intended for a horned bovine. On two of these coins the reverses are too imperfectly preserved for description, but on one the design consists of a central boss round which three equidistant half-circles or crescents are ranged with their cusps outwards. Some rude ornament occupies the concavity of the crescents which are separated from each other by a Y-shaped mark, having the arms directed outwards. These three coins are round (not square like the others) of very rude fabric, and weigh 69 grains, or 23 grains each, and do not appear to have suffered loss through wear.

Two square coins with blank reverse, and weighing together forty-eight grains, have an entirely different symbol on them from any above described. The 'dies' are not identical, as on one of them a 'taurine' is present, and a rhomboidal arrow-head or dwarf 'thyrsus' alongside of it, both of small size, the arrow-head being identical with the similar mark on the 'Taxila' gold coin figured in *Coins of Ancient India*, plate II, fig 18, where it forms one of the segments or elements which constitute the 'thunderbolt' symbol (as it may be called) which occupies the reverse of that coin, and it would be interesting if a link could be traced between this symbol and the "dorje" used in Buddhist worship at present in Tibet.

The symbol which occupies the area of the coin is one as difficult to describe as it is unintelligible. The object is sub-symmetrical and sub-polygonal with four or five projecting angles, and bounded in part by a slightly convex line. From the convex line, rise four slightly radiating strokes followed to the left hand by one or two much longer ones which curve over to the left. Though not quite identical, the object represented on both coins is the same, though obscure to a degree. It once occurred to me that the design might be intended for a human hand, and have reference to the idea recorded on a gem procured by Conelly in Khorasān, and figured in *Journal, Asiatic Society, Bengal*, for 1842, page 142, only on one coin the strokes, which in that case would represent fingers, are six in number In the gem in question, which may be of Gnostic significance, a human hand is seen lightly grasping a human ear, as though designed to illustrate the lines of Virgil·

"Quum canerem reges et prœlia, Cynthius aurem
Vellit et admonuit"—*Ecloga*, VI, 3.

Whilst, therefore, it cannot be confidently asserted that a human hand is the object represented, it is not wholly impossible that this fantastic and obscure symbol may be the outcome of a crude effort to reproduce the subject of the above gem Perhaps a larger series of these coins may clear the matter up·

I would now offer a few remarks on a class of coins, only, I believe, hitherto recorded from the Konkan, and described by Sir Walter Elliot in *Numismata Orientalia*, 'Coins of Southern India,' Vol I, pages 66 and 152c The following is the description of one of those coins figured on plate II, fig 61 —"No 61, weight 12 8 grains Transition punch-coin, found with others in the Konkan, with a bull, erroneously called a lion at pp 50 and 66, superimpressed on the punch-marks" Now this description is a very erroneous and misleading one The coin figured seems imperfect, though they are all very rudely shaped, but with two specimens of my own and six lent to me by Dr Codrington, I am able to fix the full weight of one of these pieces at 15 grains or more, and the average weight of these eight coins as a trifle over 14 grains At page 50 (l c) we read,—"A find in the Konkan displayed pieces, on which an animal, perhaps a lion, had been impressed in the centre, and above all the others," and again at page 66 "We have nothing of an earlier date of which we can speak with any confidence, unless it be a hoard of eldlings found in the Konkan with the figure of a lion (?) superimposed on the earlier punch-marks" Now this is all wrong. The author himself has corrected the error of taking a lion for a bull, but there are no punch-marks whatever on these coins, and although some have been double-struck, yet only on a single coin of my own is there any appearance which would lead to the conclusion of the 'die' having been applied over an older design, and as regards this one coin, I believe, such was not the case The term 'eldling' used by Sir Walter Elliot for the 'punch-marked' coins, or 'purānas,' is also misleading, as these coins from the Konkan are not 'punch-marked' at all, but struck from dies which, though rude and not all alike, were certainly not 'punches,' nor was one device struck over another, save in the case of coins which have been 'double struck' from the same die, as of course occasionally happens through accident. For purposes of description I have before me eight coins, all probably from the same find, as six of them are the property of of Dr. Codrington, who supplied Sir W. Elliot with the coin figured by him On seven of these coins the device is the same, though there are slight variations of detail due to the different dies employed The principal figure on all the coins is a humped bull walking to the left The horns form a crescent on the top of the head, and the hump is clearly marked Beneath the bull is a solid square which with the other minor symbols forms part of the 'die' and is not a 'punch-mark' or independantly produced Below the square is a hollow parallelogram, bounded by four lines and representing probably a 'tank.' This figure is twice as broad as the square above it, but not quite equal to it in height Above the rump of the bull is a small 'triskelis,' and behind the 'triskelis' on the right a small 'svastika' with the open angle or concavity formed by the arms facing to the right On each side of the solid square is a 'taurine' pointing outwards or to the right and left respectively, and between the 'taurine' and 'svastika' a hollow or lined square On some coins a circle with a dot in the centre is also seen near the margin, but not sufficiently well preserved in any coin to say if the 'lingam-yōni' symbol is intended The reverses of these coins differ somewhat from each other On one is a tree, with bifid and trifid leaves or branches, possibly intended for a 'cactus' or 'Euphorbia' On another a rude 'caitya' Some reverses seem blank, but most of these seem to have had a different design On one is a small animal, probably a hare, standing within a circle, strongly recalling the symbol on punch-marked coins termed by myself 'Hare in the moon,' and surrounded by an inscription, one of the letters strongly resembling the Gandharian character for '*n*.'

All the above coins present essentially the same device, but on one coin in my possession there is introduced behind the bull a large twelve-rayed sun, larger than the bull and partly hidden by it At first sight it appears as though the 'die' with the bull had been counterstruck on a piece with the 'sun' on it, but I am by no means sure that such was really the case, and it is equally probable that the 'die'-sinker first engraved the bull very deeply, and then in a shallower manner the sun behind it, and this is confirmed by the fact that the small 'svastika' which is usually close behind the bull, in this coin appears well outside the 'sun,' instead of counterstruck over it, as would seem to be what would have happened if two dies had been employed Till however, a second example turns up, the question must remain unsettled. No coin, moreover, with the solitary symbol of a twelve-rayed sun on it is known of this series

On two or three coins an upright staff is seen in front of the bull which sometimes seems supported by a tripod On one coin this staff seems replaced by a T, but being on the extreme left of the coin, the symbol often falls outside the field. The coins themselves, too, are of very rude make and often double-struck, and the design thereby injured, and on this account I think the bull came to be mistaken for a lion Besides the above coins two square ones remain of a different character, one weighs 25 grains, the other 18 They are both die-struck The first has a circle, a crozier-like pot-hook, and some other unintelligible marks on the obverse, and some obscure crooked parallel marks on the reverse The smaller coin has what may be intended for the rude figure of a man kneeling to the right, with a 'taurine' and two other symbols behind him, made of a circle with an inverted half-circle over it The reverse is blank These coins probably come from the same locality as those above described, but belong to a totally distinct issue of which no more can be said, till other specimens are available for comparison and description

In my paper 'On Punch-marked Coins' (*ante*, Vol LIX, page 258), I remark that "the '*triratna*,' strange to say, does not appear to occur on these coins" Since this was written I have acquired a polygonal silver coin of this class, with a symbol on it which I interpret as the prototype of the 'triratna,' and which may be thus described In the centre is a good-sized globe Below the globe are two 'taurines' ranged horizontally with their 'cusps' opposed to each other On either side of the central globe is a taurine with the cusps pointing upwards, and above the central globe is a crescent, or perhaps a smaller globe, as the margin of the coin cuts across and renders this point uncertain. Supporting this crescent, but not touching each other, are two crescents with their cusps pointing upwards, whilst each outer cusp supports another crescent

Now, if these crescents are viewed from above, by the symbol being turned upside down, they would present a certain resemblance to the lower tiers of a 'stūpa' or 'caitya,' but with the important difference, that each crescent (or chamber, as we should say in the case of the 'stūpa'), is separated from its fellow and not tangential thereto, as is always the case, so far as my experience goes, with regard to the chambers of the 'stūpa' I regard, therefore, the symbol as having no relation to the 'stūpa,' but as a combination of several crescents

Now, if we turn to Mr Robert Sewell's paper on 'Early Buddhist Symbolism' (*Journal of the Royal Asiatic Society*, 1886, p 364), it is easy to conceive how the 'scarab' (p. 398, l. c) can be converted, by what I may describe by the term 'heraldic metamorphism' into not only the 'triçūl' as Mr. Sewell contends, but into the 'triratna' also. The central globe represents the body of the 'scarab'; the legs are indicated by 'taurines,' the lower or posterior pair being represented as opposed to each other, as they are so frequently seen to be, when the animal is engaged in the domestic operation of 'pill-rolling.' The lateral legs are represented by a pair of 'taurines' directed forwards The anterior crescent in the middle represents the head of the 'scarab,' whilst the pair of crescents on either side represent the strongly curved anterior legs of the insect The symbol in this form, built up as it is of the meagre materials of 'bull' and 'crescent,' can of course, only be viewed as the prototype of the perfected 'triratna,' but the germ of that symbol is there, and later developments have merely arisen by the process of addition of a floreated ornamentation having for its aim a higher artistic conception and effect.

Note on Major Francklin's Manuscript description of Gaur.—By H. Beveridge, I. C. S., (Retd.)

(Read February, 1894.)

The existence of this manuscript seems to have been first brought to notice by Mr. Grote, who recommended Mrs. Ravenshaw to use it in editing her husband's work on Gaur. Afterwards, Mr. Grote took upon himself the task of annotation, and added many notes from Francklin to Ravenshaw's text.

A few years ago, our Society applied to the India Office for the manuscript, with the view of printing it, if this should seem worth while. The Secretary for India referred the matter to Dr. Burgess, who gave it as his opinion that all the valuable information in Francklin's report had been extracted by Mr. Grote. In consequence of this, the manuscript was not sent to our Society.

Since then, I have examined the report, and compared it with Ravenshaw's Gaur, and I have found that Dr. Burgess's opinion was correct. All, or nearly all, that is of value in the report has been put into Mr. Grote's notes. I therefore cannot recommend that the report should be published, though it does seem hard that a paper submitted to the Court of Directors, so long ago as April 1812, should have been neglected till 1878, and then be superseded by the pith of it being put into another book. Had it been used at the time, the map and drawings which accompanied the journal might have been preserved. In his letter to the Court of Directors, dated Bhāgalpur, 12 April 1812, Francklin speaks of forwarding a journal, map, drawings, &c., and in the journal there are frequent references to drawings by their numbers. The journal is in the Map-room of the Registry and Record Department of the India Office, but the map[1] and drawings have disappeared, and

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[1] The loss of the map is of small moment, for Francklin mentions that he procured it from Mr. Ellerton, and that it was constructed by Creighton. It must, therefore, have been the same as that published in Creighton's Gaur.

App. D. p. 90.

Mr Grote's letter to Mrs. Ravenshaw shows that they were not forthcoming about twenty years ago.

William Francklin was, like Warren Hastings and Impey, a Westminster boy, and was an officer in the Army of the East India Company He was the son of a clergyman named Thomas Francklin, who was a man of some note in the literary world, but who unhappily got confounded with his more celebrated namesake, Benjamin Franklin. Macaulay corrects the mistake, and then impales his unoffending countryman on the point of a Greek quotation The son is well known as the biographer of George Thomas, and as the author of a work on the site of Palibothra, in which he endeavours to identify it with Campānagar, a village about four miles to the west of Bhāgalpur. He was mistaken, no doubt, but the book is still worth reading His principal point was that there was a river near Campānagar, called the 'Erun Bhowah,' which certainly resembled in sound, but not in size, the Greek Eranoboas He seems to have converted Major Wilford to his opinion, for he speaks of him as having given up the Rājmahal site in favour of the Bhāgalpur one Referring to this, Francklin speaks with stately courtesy of Wilford, as a man "with whom to be associated, is to be associated with learning itself" But the most picturesque circumstance in Francklin's life was a tour which he made in Persia in 1786, when he was an Ensign and only three-and-twenty years of age. On this occasion he lived for about six months in S͟hirāz as a member of a Persian family. He became a Major in 1810, and a Lieut.-Colonel in 1814 For seven years he was Regulating Officer at Bhāgalpur, and in that capacity had, I believe, to do with the invalided sepoys who were at that time settled in the Jungle Tarāī We are told that he himself was invalided in 1815, but Bishop Heber, who met him at Bhāgalpur in 1824, describes him as being then inspecting field-officer of Bhāgalpur The Bishop describes him as being a very agreeable and communicative old man, and as the possessor of curious and interesting collections. Francklin retired from service in 1825, and died in April 1839, at the age of 76 At the time of his death he was Librarian to the Royal Asiatic Society. From a casual reference in his book on Palibothra[1] we learn that he was married, and that his wife accompanied him on a visit to Dēōgaṛh There is an account of him in the National Dictionary of Biography, but the author of it has not always verified his references, and has made some mistakes as for example, when he speaks of Francklin's having lived *eight* months with a Persian family in S͟hirāz.

The report on Gauṛ is entitled "Journal of a Route from Rājmahal to Gaur, A. D. 1810 by Major William Francklin, Regulating Officer at Bhágálpur." The first entry is "11th December, 1810.—Left Rájmahál and in four marches reached the village of Aurangábád, the south-eastern boundary of the Bhágalpur district." From Aurangābād (now in the Jangīpur Subdivision of Murshidābād), he went to Sutī, crossed the Bhāgīrathī at a ford into the Cossimbāzār island, then crossed the Ganges to Sibganj, and proceeded towards Mōdhīpur. "After winding through the forest we passed the village of Chandy, where are erected some indigo works belonging to Mr. Ellerton, of Goamalty, pleasantly situated in the woods and near the river. At 9-30 A. M., encamped at the village of Mōdhipur, at about 20 yards from this village the Ganges branches out to the southward, and you enter the Bhāgīrathī river, on which is situated the city of Gaur. This river must not be confounded with that which bounds the Cossimbazar island to the N.-W., bearing the same name, distance 9 miles. (See the map.)"

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[1] The 'Muhudipur' of Pemberton's Map, and the 'Mahdipur' of Cunningham.

The report is not a long one, for it is contained in a thin folio of about eighty pages. The second part of it is occupied by an account of Panduā and a historical memorandum. From the dates in the Panduā Journal it would appear that the '11th December, 1810,' of the first entry of the Gaur Journal, is a clerical error for "11th November."

The Journal before noticing the buildings in detail gives the following general description of Gaur:—

"What remains of the ancient city of Gaur is situated on the banks of the Bhágíráthí river, enclosed in deep and thick jungles. The river runs east and west, and formerly skirted the walls of the royal palace, though it has in the course of time considerably receded.

It is situated 100 miles east-by-south of Bhagalpore, 28 miles S. E. from Rajmahal, and 11 miles distant from Maldah. You enter from the eastward through the Katwali Gate. The extent of the city of Gaur, without including the suburbs, is about ten miles in length, but in no place is it broader than 2½ or 3 miles. It is surrounded on all sides by a stupendous mound of earth, 250 ft. wide at the base, and from 30 to 40 ft. high, the top of this embankment is now planted with rows of lofty trees. This embankment was no doubt intended to protect the city, which is situated on low ground, from the destruction occasioned by the overflowing of the rivers, at the season of the periodical rains. Two grand roads led through the whole of the city, raised with earth and paved with brick, commencing at the Katwali Gate and terminating at the N.-W. entrance. Within this extent the remains of bridges which have been cut (?) over the low grounds, are still visible. Over every part of this city large tanks have been formed, with innumerable drains and ditches, to carry off the water, the earth of which, being thrown up, has elevated the ground considerably from the level country. The ground about Gaur is everywhere scattered over with bricks, which are turned up, and mix with the soil, which is very rich, and in those parts that are cultivated, highly productive About half a mile from the Katwali Gate is a bridge regularly paved with brick, with stones underneath It has a gentle ascent and descent, and appears to be of great antiquity At the western extremity are two stone pillars having Sanscrit inscriptions[1] On each side of the road leading to the royal palace are several mosques built in the Pathan style of architecture, like those to be seen at Delhi They are entirely round, and have arched windows of brick In the neighbourhood are many tanks, and the cultivation is considerable and the appearance of the surrounding scenery picturesque Nearly opposite the fort, in which is situated the royal palace, is a lofty column of Pathan architecture It is circular in form, has several windows, and is surrounded at the top by a cupola.

"This column was built by Firoz Shah, one of the Pathan princes of Gaur, and in the style of its architecture resembles the columns built by Firoz Shah which are still to be seen at Allahabad and Delhi"

Then follows the description of the Minār, which Mr Grote has extracted (p 28, l c) It may be noted that Francklin prefixes to the fragmentary inscription, obtained[2] by him at Goamalty, these words in Persian —

نقل کتابه دروازه منارة فیروز شاه من احاطة قلعة گور

That is, "Copy of the inscription on the door of the Minār of Fīroz Shāh, in the Fort of Gaur"

These words show that the tradition that the Minār was built by Fīrōz Shāh existed before Francklin's time We know too that it was in existence when the *Riyāzu-s-salāṭīn* was written, i e, about 1787. See Persian text of that work, p 126 In his note, p 28 of Ravenshaw's Gaur, Mr. Grote refers to Fīrōz Shāh as having only reigned from 893 to 895, but the inscription from the Murshidābād district, of which a translation appears in the *Proceedings* of our Society for February 1893, p 55, shows that Fīrōz Shāh's reign extended to at least the beginning of 896 (2, Muharam) Mr Blochmann also states that Fīrōz Shāh reigned till 1491, or 896, *vide* historical note in Ravenshaw's Gaur, p 100 The coin, however, to which Mr Grote refers, as fixing the chronology of Fīrōz Shāh II, only gives the date 893, and Blochmann prefers 895 for the last year of his reign At p 56, *l c*, Mr Grote gives an inscription stated by Francklin to belong to the Golden Mosque at Panduā The quotation is correct, and in Francklin's journal, p. 25, the inscription is preceded by Persian words indicating that it is a copy of an inscription from the Golden Mosque of Paṇḍuā. But I think that Francklin or the Munshī must have made some mistake. An inscription bearing the date 885, and referring to Yūsuf Shāh, can have nothing to do with the Paṇḍuā mosque, and in fact no such inscription now appears there. Two inscriptions belonging to this mosque are given in Ravenshaw, p. 56, and their dates are 990 and 993, *i. e.*, more than a hundred years after the date of Francklin's inscription. The inscription, too, comes into Francklin's Journal at an odd place, if it belongs to Paṇduā, for it occurs in his account of Gaur, and not in the subsequent account of Panduā. After describing the Golden Mosque at Gauṛ (pp. 4 and 15 of Ravenshaw's Gauṛ), and giving its inscription, which is of the year 932, or 1526 A. D., Francklin proceeds as follows (p. 25 of Journal). "There is another Golden Mosque at the village of Chandy, near the south-eastern entrance of the city, and a third at Purrooah once the capital of the kings of Bengal. They are of similar architecture, but those of Chandy and Purrooah are much smaller in size to the one above described." "The following inscription appears in front of the Golden Mosque at Purrooah." He then gives the inscription and translation, which Mr. Grote has quoted at p. 56, *l. c.*

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[1] Cunningham does not notice these inscriptions

[2] Francklin uses the word 'found,' but this merely means, that he saw it there after it had been removed to the factory by Mr Ellerton or Mr Creighton. The Chānd Darwāzā inscription was also 'found' at Goamalty Ravenshaw, p 18, note.

On referring to the map in Creighton's Gaur it appears that the Chandy Golden Mosque must be the small golden mosque described at p. 38 of Ravenshaw's Gaur. Francklin's inscription then cannot belong to it, for the small golden mosque was erected in the reign of Husain Shāh, *i. e.*, in the early part of the 10th century, A. H. Nor can it, as we have just seen, belong to the Panduā golden mosque. Most probably the inscription belonged to the Çāntipārā mosque at Gaur. We have it from Creighton (quoted by Mr. Grote, p. 30, *l. c.*), that an inscription was found near the Çāntipārā mosque which gave the date of Francklin's inscription, *viz.*, 885. Mr. Grote conjectures that the inscription referred to by Creighton is that now at the Qadam Rasūl mosque, and published at p. 22 of Ravenshaw's book. But Mr. Ravenshaw says that this inscription is supposed to have belonged to a mosque not far distant, and now in entire ruins. The latter part of this description, at least, does not apply to the Çāntipārā mosque, *vide* Ravenshaw, p. 30. It is also mentioned there that an inscription said to have been taken from the Çāntipārā mosque contains the name of Yūsuf Shāh. This is just what Francklin's inscription does. Of course the inscription alluded to by Ravenshaw at p. 30, may be that given by him at p. 22, but if so, one would have expected at the latter passage an express mention of Çāntipārā. As Mr. Grote has remarked, Francklin nowhere mentions the Çāntipārā mosque by that name, and it is probable enough that the mosque called by him the "Mahajan Talah Mosque" is really the Çāntipārā one.

Immediately after giving the inscription said by him to belong to the Golden Mosque of Panduā, Francklin proceeds as follows —

"A large space of ground formerly constituted the area, or outer court of this mosque, which is scarcely visible from the excessive high and thick jungle that encompasses the whole of the building. There are, however, evident marks of adjoining buildings displayed in a mass of ruins and rubbish, these were most probably the kitchen and other offices, for the use of the attendants belonging to the mosque, and places for the Maulavies, or readers of the Koran, the Muazzins, or criers to prayers, and other persons attached to the institution.

"Being situated on the summit of a pretty steep ascent, were the surrounding jungle cleared away, it would command a delightful prospect of the adjacent country. The column of Firóz Sháh being in sight, the remains of the royal palace, the numerous tanks in the neighbourhood."

If this description relates, as grammatically it should, to the mosque of which he has just given the inscription, it is clear that the word 'Panduā' must be a mistake, for the Minār and the tanks of Gaur cannot be visible from Panduā. But I am not sure if Francklin, after giving the inscription, does not revert to the Golden Mosque of Gaur. There are parts of the description just quoted which might apply to the ruins of the Madrasah, as described at p 34 of Ravenshaw. The Madrasah is marked in Pemberton's Survey-Map of 1847-49, of which there is an enlargement in Ravenshaw, on the north bank of the smaller Sagar tank. On the west of the tank there is a mosque marked at a place called "Soonar Gong". Possibly this is the golden mosque from which Francklin got the inscription. The village of Chandy, or Chāndnī, mentioned by Francklin, is not marked in the enlargement of Pemberton. Creighton's map, however, shows it. It was on the Pagla, and was once the factory of Mr. William Grant, the friend of Creighton.

Francklin speaks of the tomb of Husain Sh̲āh as being still in existence, and calls it the "Bādsh̲āh-kī-qabr". His description is quoted by Mr Grote, p 24 *l c*, in a note to the photograph of Fath K̲h̲ān's tomb. But it is evident from the anonymous * account in Glazier's report on Raṅgpur, Appendix A, p 107, that the tomb had been despoiled many years before Francklin's visit, and that he was probably in error in speaking of the bodies of Ḥusain Shāh and his family as still lying there. The following is the account given in Glazier :—

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* From Creighton's account of Orme's remarks, especially those about the block lying by the river, it seems probable that the Raṅgpur MS. is a copy of Orme's remarks. The question might be set at rest by examining the Orme papers, which fill part of a press in the India Office Library.

"The Maqbara is a burying-place, built of bricks, the gates and walls of which are very curiously ornamented with figures and flowers impressed in the bricks when they are burned and . . . . similar to the Dutch tiles in Europe, and which to this day appear to have received very little detriment from time or weather. From this place Captain Adams removed the two finest tombs in the city, said to contain two kings, named Husain Shāh and Nasrat Shāh. What became of the most principal parts of these tombs, I cannot learn, but I believe they are in Calcutta, and there are now by the waterside five pieces of black marble polished on two sides, twelve feet in length, two feet high, and two feet thick, which were part of them."

Probably it is one of these pieces which is described at p. 3 of Ravenshaw's Gaur, where we are told that, "On the road-side, between the palace and the Bhāgīrathī river, there now lies, split in twain, a vast block of hornblende, which, having been carried thus far, has been dropped and left, as broken, on the highway, to bear its testimony against the spoilers."

From a note to the translation of the *Siyaru-l-muta'akhirín*, p. 184, we learn that Captain Adams's spoliation took place about 1766, and that when the royal tomb was opened by him, an ūd-dān (عوددان), or censer, was found at the foot of the body.

Francklin's description of the palace follows immediately after that of Husain Shāh's tomb. The material portion of it, including the inscription of Barbak Shāh, has been given by Mr. Grote, *l. c.*, pp. 18, 19.

Francklin visited Mr. Ellerton at Goamalty, and notices the remains there of "a very handsome mosque built of stone and brick; the only minaret remaining has a fanciful appearance. The remains of marble columns in the outside of the verandah of the building are still to be seen."

Although Mr. Grote's extracts have been carefully made, and have perhaps made the publication of Francklin's journal unnecessary, there is an Appendix to the latter which deserves notice. It contains a Chronological Table of the Muhammadan rulers of Gaur, and a Historical Memorandum regarding them. The interest of the memorandum consists in the fact that it is, word for word, the same as that given by Buchanan, and which is printed in Montgomery Martin's *Eastern India*, Vol. II, 616–21. Even the spelling of the proper names is the same. For instance, in both, the name of the Hindū usurper, commonly called Rājā Kāns, appears as Gones, and he is described in both as Hākim of Dynwaj, with the parenthetical suggestion that he was perhaps a petty Hindū chief of Dinājpur So far as I can see, the only difference between Francklin and Buchanan is that Francklin ends with the word "province," whereas Buchanan adds the words, "as I shall afterwards have occasion to show." The Chronological Table too, given by Francklin, is, word for word, the same as that given in Appendix N, p 28, of the 2nd Vol. of *Eastern India.* Even the heading and the memorandum at the foot are the same. The very mistakes are the same in both. For instance, in both, the Hindū king is called Rae Lukhmeesey, and the duration of his reign is given as eight years, though in the column of dates he is said to have reigned from 510-590, H S In Francklin's table the *eight* has been corrected into *eighty,* but this has been done in pencil, and apparently at some subsequent time In order to clear the matter up I have referred to the Buchanan MSS The account of the Muḥammadan rulers of Gaur is to be found there in the Dinājpur volume, I, pp. 72-83. It is headed, "Part 2nd Muhammadan Government," and is word for word as in Montgomery Martin There is no reference to Buchanan having borrowed it from Francklin or from any one else. The Chronological Table is in the 2nd volume of the Dinājpur MSS, and is in the Appendix, pp 2-10 It, too, is word for word the same as Francklin, except such insignificant changes, as putting the word "Memorandum" for Francklin's phrase "Conclusive remark" There is no reference to its having been obtained from Francklin, but there can be no doubt of the fact, for at the end of the Memorandum (in the Buchanan MS) we have the words "True Copy," and the initials "W. F" in Francklin's own handwriting It is clear then that Buchanan got the table from Francklin, and I have no doubt that he got the descriptive account also But I do not suspect Buchanan of plagiarism He was an honest man, and a friend of Francklin They must have explored Gaur at about the same time, though I do not think that they visited it together, for in a note to his journal, Francklin remarks that after his return he was informed by his friend Dr Francis Buchanan, that what he called 'black marble' was in reality hornblende It is very likely that the circumstance of their being engaged in the same line of enquiry has led to the appearance of Francklin's papers in the Buchanan MS Francklin tells us at the end of Section I, of his account of Gaur, that the historical memorandum "is translated from some MSS materials procured through the kindness of Mr Ellerton, of the factory at Goamalty, a gentleman who unites business with science and a love of the arts, and whose polite hospitality to us during our stay at his mansion entitles him to every consideration and thanks"

To the Table is appended, what is called, a "Conclusive remark," and which, with unimportant verbal differences, is the same as Buchanan's "Memorandum."

Francklin attests his Historical Memorandum as being a "True translation," but it is evident that it is not merely a translation from the Persian, but contains comments of his own, or of Mr Ellerton's The opening paragraph refers to "A manuscript account which I procured at Pandua," but I do not feel sure who the *I* is. Ellerton lived at Goamalty in Gaur, but perhaps it was he who procured the MS at Panduā. Or the *I* may refer to the Persian Munshī.[1]

Francklin also writes the words "True translation" at the end of his Chronological Table; though that is a compilation from various authorities, and is described by him, and also in Buchanan's *Eastern India*, II, App. N, p 28, as "Selected from native historians." It may be however, that Ellerton's Munshī drew up the Table and that Francklin only translated it

The point of the origin of the Historical Memorandum and of the Chronological Table is an interesting one, and I am unable to clear it up entirely. It is something to be able to trace it back to Gaur and to Mr Ellerton. What I imagine to have occurred is that Ellerton got the Persian materials and made them over to Francklin, that Francklin translated them, and gave copies to his friends Ellerton and Buchanan, and that the latter by an oversight failed to note from whom he had received them. Though the Memorandum agrees pretty closely with the *Riyāzu-s-salātīn*, it differs from it about Sultān Ibrāhīm, or Ibrāhīm S̲h̲āh The *Riyāz* makes him the Sultān of Jaunpur, but the Memorandum describes him as the grandfather of Ḥusain S̲h̲āh, and as having been put to death by Jalālu-d-dīn[2]

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[1] Francklin was an accomplished Persian scholar, but Buchanan was not, and so could not have made any direct use of a Persian MS

[2] It may be noted for the benefit of future inquirers, that at the beginning of the Dinājpur Volume I, of the Buchanan MSS, pp 5–8, eight Arabic inscriptions from Panduā are given, including that on the Adīna Mosque, which gives the inexplicable date 707 The inscriptions are, I think, all known ones, and have been already published, but it may be worth while to examine transcripts which are now some 90 years old.

Three Documents relating to the History of Ladakh: Tibetan Text, Translation and Notes.—*By the late* DR KARL MARX, *Moravian Missionary at Leh, Ladakh.*

(Read January, 1894.)

Introductory remark by the Rev. Dr Gustaf Dalman, of Leipzig, Germany.

Under the above title, in Vol. LX of this *Journal*, *ante*, p 97–135, there was published only the first of those Three Documents, with an 'Introduction' Dr Karl Marx, my ever-lamented brother, who was born at Niesky, in Silesia, a province of Prussia, on January 9, 1857, and died on May 29, 1891, at Leh, was no more alive, when this first part of his paper came out. He left behind him a translation of what he called the B-MS. in his Introduction, beginning with king De-ldan-nam-gyal, and of the first part of C-MS from the same point of the history. His intention was (*vide* Vol LX, p 100), in his next publication to commence with this De-ldan-nam-gyal, and to take for its basis 'the rest of B-MS. with such additions as may be derived from C-MS.' In a third publication he intended to give the second part of C-MS. For this last one, however, no translation has been found among his papers. I hope, the friends of the history of Ladakh will be thankful to get at least the translation from B-MS., designed for the second publication, together with some additions from the translation of the first part of C-MS., chosen by me as the present editor, who only feels too much that he cannot supply the place of the Author.

(Seng-ge-nam-gyal.) His sons were De-ldan-nam-gyal, Indra-Bhodhi-nam-gyal, (and) De-ch'og-nam-gyal. (These) three were born.

(XXIII) *De-ldan-nam-gyal* was made king. Indra-Bhodhi-nam-gyal was admitted (to the brotherhood of Lamas) at Stag-na, by the Ch'os-je Mug-dzin, and came to be the most prominent amongst the disciples of Stag-(ts'ang) ras-(ch'en). At the time of the erection of the He-mi and T'eg-ch'og-(Lamaseries), he acted as superior (? superintended the building), and became the most excellent amongst the clericals who delight in the doctrine. He was made ruler of Gu-ge. To the youngest son De-ch'og-nam-gyal, Spi-ti and Zangs-kar were allotted as his portion, he ruled there De ldan-nam-gyal resided in Ru-t'og in summer, and in Ladakh in winter. He united under his sway (all the country) from Pu-rig to the Mar-yum pass In memory of his father, he erected at Sheh an image of (Shākya-) T'ub-pa,[1] made of copper and gilt, three storeys high, also a Chorten, five storeys high, of which the thirteen wheels,[2] the canopy and the crowning-piece[3] were again made of copper and gilt. In memory of his mother he built at the head of the Te-war-gorge[4] a Ma-ñi-ring-mo,[5] at either end a Chorten, one of the Great-Jang-ch'ub-, the other of the Great-Nam-gyal-(type)[6] (Also) at Leh-palace he put up an image of Shākya-T'ub-pa out of copper and gilt, and two storeys high As it had been customary with his father, so he likewise appointed permanently for Nub-ra, Zangs-k'ar, Bab-go, Ting-gang, and other places 108 Lamas each, who were to perform the 100 millions of O-mañi-padme-hun-incantations there once a year Furthermore, for the sake of his own reputation with posterity he erected at Leh an image of Chan-ras-zigś out of copper and gilt, two storeys high, an assembly-hall, and a silver-Chorten two storeys high

At that time, he appointed his minister Shākya-gya-ts'o Field-marshal In the female Water-Ox-year the Ladakh army took the field Many men and women of Kar-bu they carried away captive. He-na-ku and Stag-tse were reduced and brought into subjection Next, Chig-dan and Sha-kar were taken (broken) Then he led his army on to Sod-pa-sa-ri, he took Sod-castle, and (also) gathered in the harvest of the fields On his way back, he sent his army against Sum-t'ang and conquered it, then attacked Kar-tse and again was victorious He brought with him the chieftain (of that place) T'i-Sulṭān In the male

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[1] Buddha. The image is still there, and the Chorten as well

[2] In Ladakh, wherever they are, there are always 13 of these wheels, but many Chortens are entirely without these They are almost always red, and decrease in size from below upwards, so as to form a slender cone In this case they are of copper and gilt I believe their number is in some way connected with Shamanism Radloff, in speaking of the Shamanists in Siberia, mentions (if I remember right, the book is not within my reach at present) 13 worlds, through which the man who strives to obtain perfection has to press upwards

[3] The top-ornament of the Chorten, like a large open flower (lotus), is called Zarrazag

[4] Gorge is half-way between Leh and the bridge (Road to Tshushod)

[5] 'Long Mañi,' in contradistinction from the 'round Mañi,' the Mañi driven by waters and others This is the most conspicuous Mañi in the whole country

[6] There are eight types of Chortens The Jang-ch'ub is distinguished by square-steps, the Nam gyal by circular steps

Wood-Tiger-year he marched against K'a-pu-lu and conquered Ch'or-bar and T'or-tse-k'ar These districts he apportioned to He-tan-khān (and) Sultān-khān, these three (?). The chieftain of Skar-do and all the Baltis were unanimous in their complaints to the Nawāb (of these high-handed proceedings). (Consequently), an army of Turks numbering 200,000 men arrived at Pa-sa-ri, but the minister Dug-nam-gyal of Ladakh and the forces occupying (the castle) delivered a battle against the Turkish army and killed many Turks. They took away their flags and kettle-drums and (thus) carried off a complete victory over the enemy

His son was (XXIV) *Lha-ch'en-de-legs-nam-gyal*

At his time the Bhutān state and the Bod-pa had a dispute. Now, the (pope of) Bhutān was the patron-Lama of the king of Ladakh (Hence), the latter sent a letter to Tibet, saying, that he was prepared to take up his quarrel. The Bod-pa carefully considered the matter "Supposing," they said, "the king's succour should arrive here first, it would no doubt be in accordance with the king's name, a nice affair indeed Would it not, therefore, be well to raise an army (here) first?" To this suggestion they all agreed.

There happened to be at that time at Ga-ldan-Lamasery a Lama, a Mongol, called Tsang. The calculations pointed out him (as the destined leader) He, accordingly, turned layman, and heading the Mongol tribe and a powerful army of Bod-pa he (soon) reached (Ladakh) At the commencement (of actual warfare) it came to an engagement at Zha-mar-ting.[1] In time, the Mongol army arrived at Bab-go. The king then stayed at Ting gang castle, whilst the Ladakh captain and a garrison held Bab-go castle Although they succeeded in holding their own for three years, yet they were unable to drive the Mongol army back again So the king of Ladakh despatched a messenger to the Nawwāb of Kashmir (The desired object was obtained) an immense army appeared on the scene. A battle ensued on the Ja-gyal plain near Bab-go The Bod army was routed, they left behind them a large quantity of armour, bows, and arrows. Their rout continued until they reached Spe-t'ub The Mongol army in their flight (eventually) reached Ta-shis-gang There they built a fort, shut it in with a wall, and surrounded it with water Into (the fort) soldiers were placed to occupy it.

Upon this, the De-pa-zhung,[2] apprehending that (now after all) the king of Ladakh might come and bring succour, and that thus (may be) another war might ensue, desired the Ḍug-pa Omniscient (Mi-pa'm-wang-po) to go and negotiate for peace In compliance with his injunctions the Ḍug-pa Omniscient (undertook the journey) and arrived at Ting-gang. Simultaneously some other messengers of the Bod-pa reached there as well (The result of their deliberations was as follows —)[1]

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[1] Halfway between Ṭa-shis-gang and Garkun-sa (Walker's map).

[2] The name of the palace of the Dalai-Lama has usually the meaning of the 'Supreme Government'

"The Bod-pa have come to consider that whereas Tibet is a Buddhistic and Kāçmīr a non-Buddhistic country, and whereas Buddhistic and non-Buddhistic religions have nothing in common and are hostile to each other (it follows, that) if at the frontier the king of Ladakh does not prosper, Bod also cannot enjoy prosperity" (This being so), the occurrences of the recent war should be considered things of the past" The king, (on the other hand), undertook in future to keep watch at the frontier of Buddhistic and non-Buddhistic (Faith), and out of regard for the doctrine of Sangs-gyas would not allow the army from India to proceed to an attack (upon Bod).—(As to) merchandize in demand in Kāçmīr (the following agreement was come to) the fine-wool of Nga-ris-skor-sum shall not be sold to any other country, that the price of fine and coarse wool mixed shall be fixed at eighty Nyag[2] to two Rupees, to be paid in both money and kind, that the Jang(-t'ang) people shall not be allowed to use the Nyag of the people of the (Indus-) gorge, that it shall not be said of the wool of Jang (-t'ang) men that it contains soil, (or) stones, (or) moisture, also that to Ru-t'og itself none but the court-merchant[3] shall be admitted. Regarding the fine-wool-(trade) · four Kāçmīrī merchants shall reside at Spe-t'ub and do the trading with the Kāçmīrīs of Kāçmīr, this shall be the only way by which it shall go to Kāçmīr No Kāçmīrī of Kāçmīr shall be allowed to go to Jang-t'ang Those Ladakh-Kāçmīrīs, who go to Jang-t'ang, shall not be allowed themselves to go down to Kāçmīr with loads of fine-wool. Regarding Nga-ris-skor-sum Mi-p'am-wang-po's stipulations were to this effect it shall be set apart to meet the expenses of sacred lamps and prayers (offered) at Lha-sa, but at Menser the king shall be his own master, so that the kings of Ladakh may have wherewithal to pay for lamps and other sacrifices at the Kailāsa and the lake, it shall be his private domain. With this exception, the boundary shall be fixed at the Lha-ri stream at De-ch'og —From Tibet the Government trader shall come with two-hundred loads of tea, and nowhere but by Ladakh shall rectangular tea-bricks be sent across the frontier. Should the Government trader fail to come every year, then the above stipulations shall no longer be binding. The king of Ladakh, (on the other hand,) shall send [once in three years] a Mission conveying presents to the clergy of Bod. As regards presents to ordinary Lamas the quality (and quantity) is not fixed, but to the La-brang steward[1] shall be given 10 Zho[2] of gold,[3] 10 shang of scent, 6 pieces of calico, (and) 1 piece of soft cotton-cloth (Again) throughout their sojourn (the members of the Mission) shall receive daily rations. For the road (shall be supplied) (beasts of burden to carry) 200 loads,[4] 15 baggage ponies, and 10 riding-ponies; (and) three men to act as groom, cook, and servant, private ponies shall have fodder as much as they like, (also) for the steppe-districts One large tent, (and) small tents for the leader, the head-cook (and) the treasurer, etc The pony-loads shall be carried along by double stages, and further on, from district to district both going and coming It also had been stipulated that with every Mission one of the three provinces should be made over (to Lha-sa), but the king entered a request with the De-pa-zhung that he, begging to disagree with Mi-p'am-wang-po's decision, would prefer to renounce his rights to the provinces entirely, if they would give to Mi-p'am-wang-po in the room of Ngāris-skor-sum three districts in Bod itself Accordingly the De-pa-zhung made over to Mi-p'am-wang-po three villages "[5]

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[1] The treaty is still in force to this day, only a few slight alterations in favour of Ladakh have been made

[2] 12 Nyag = 1 Batti (4 lb)

[3] From Ladakh

Then also the king of Ladakh had to send [his wife and children to Kāçmīr to stay there as hostages for three years], and along with them 18 piebald ponies, 18 pods of musk (and) 18 white yák-tails, whilst it was also settled, that the 500 bags of rice, being the revenue accruing to the king of Ladakh from his Jagīr Na-gu-shar should (regularly) every year be sent up from Kāçmīr.—This rice ceased to be sent since the Ladakh empire was overthrown by the Sikhs —Otherwise prosperity was soon restored. The king indeed, in all his doings, had none to surpass him, and State and Church both made progress.

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[1] An official of the Dalai Lama, see Koeppen, *Die Religion des Buddha*, II, p 334

[2] 'Delicate pair of scales,' gold-weights

[3] Manuscript C here inserts '10 rose-fruit weights of gold,' *i e*, the weight of the red fruit of the ordinary *Rosa canina*

[4] Now 260 loads

[5] In Manuscript C there are 9 articles of this treaty Article 1 is altogether wanting in Manuscript B —Articles 8 and 9 are slightly alterated We therefore give them here I As in the beginning the king Skyid-lde-nyi ma gon (*vide* Vol LX, p 114) gave to each of his sons a separate kingdom, the same (delimitations) shall obtain now —8 Ru-t'og, Gu-ge eli shall be annexed to Lha-sa in order (that from the revenue derived from these districts) the expenses of sacrificial lamps and (of the reading of) prayers may be defrayed —9 Mon-ts'er (near the holy lakes,—not on Walker's map) shall remain a domain of the king himself, whereof he shall be sole lord (and master) The revenue (of Mon-ts'er district) shall (in part) be used to pay for sacrificial lamps at the Kailāsa and the Lakes

His sons were Lha-ch'en-nyi-ma-nam-gyal and Ngag-wang-nam-gyal, Wang-ch'ug-nam-gyal, Ga-ldan-nam-gyal; of these 5 (*sic!*) brothers (XXV) *Nyi-ma-nam-gyal* was made King. In accordance with the rule, to act on the principles as described in the biographies of the ancient Kings of the Faith, he lauded the virtuous and suppressed evil-doers, etc. In pronouncing judgment, also, he never merely followed his own desires, but (always) in the first place, consulted his state-officers. He appointed elders of superior intelligence from every village to assist him, and such as wanted his decision in rescripts, questions relating to field or house-(property) he did not leave at the mercy of interlopers or partial advisers, but having instituted (the councils of) state-officers and elders, he introduced the oath on the (three) symbols, (and defined the rule) that first the primary origin (of any dispute) must be traced, and then found out what verdict is to be given. This edict surpasses in excellence any of those that were passed by all the dynastic kings (of Tibet).—This same King of the Faith presented to all the Colleges in Bod, but especially to Lha-sa and Sam-yas, and similar Lamaseries, gold-water (and) sacrificial lamps. To all the great Lamas without distinction he made presents, whilst the brotherhoods were invited to Tea-generals. (Also) the Congregations that were under his own sway received honours without distinction. (He erected) images of the Lha, that he himself worshipped, out of gold and silver, (caused) holy books (to be written, and built) the Za nang-Mañi-ring-mo.[1] Printing-blocks of Dharanī of different kinds, such as were used at the erection of the symbols of Body, Word, and Spirit, were engraved (e.g.), of the Jam-dud-zang-sum, Jam-yangs-stod-pa gang lo-mon-lam, Shes-ja-k'a-yings, Ser-od-yang-skyabs, Ka-gyur-ro-chog, and the blocks of the Le-dun. All these having been satisfactorily completed, he distributed sacred books amongst all the laity. He (also had) a Mañi-t'en-skor put up, made of gold, silver and copper. Again, amongst all the people there did occur neither strife, nor robbery, nor theft, it was a life passed in such happiness as that of a child with his fond mother.

After this when the king's wife had given birth to a son, Lha-ch'en-de-skyong-nam-gyal, she died. He afterwards married Zi-zi-k'a-t'un of Purig. She bore a son, Ta-shis-nam-gyal and a daughter Ṭa-shis-wang-mo, in all two children. Later on (XXVI) *De-skyong-nam-gyal* married Nyi-da-wang-mo of Lho-mon-dang,[2] and himself was appointed to the Government. A son, Sa-skyong-nam-gyal, having been born, (the two), on account of disagreement of temper, separated, and the queen returned to the South. Subsequently he married another wife, and a son, P'un-t'sogs-nam-gyal, was born. The state-officials, council of elders, and the people, having entered a petition that Ṭa-shis-nam-gyal should be ordained and become a Lama, or else reside at Ting-gang-palace, the father, Nyi-ma-nam-gyal (himself), turned King of the Faith. The prince De-skyong-nam-gyal's mother having died whilst he was yet an infant, Zi-zi-k'a-t'un took care of him; consequently, whatever his dear mother said, was all right and could not be refused. So by persuasion the queen-mother (obtained it from him, that) Ṭa-shis-nam-gyal was appointed to rule from Po'-t'ok-sa over all Pu-rig. From Ngul-dog palace at Mul-bhe he built [the bridge?] He married a daughter of the Stog-ka-lon, but had no children. Princess Ta-shis-wang-mo was taken by the king of Kiṣṭwār as his consort Although (everyone) prayed not to give her away, because the language as well as the religion of the people of Hindūstān were different, yet, (the queen) said. a child's rulers are father and mother, and would not listen, but gave her away (Soon after, however,) the steward, Gha-p'el, amongst others of his servants, informed the father that she was not even allowed to see the light of day, upon which (the king) ordered him to bring the girl back by fair means or foul, and despatched an army. When the girl was being carried off, the king and queen of Kiṣṭwār, who were both very fond of her, said "Let us also go to Ladakh" With the captain and a few attendants they got under weigh. But Zi-zi-k'a-t'un here (in Ladakh) gave secret orders to this effect: "If the king of Kiṣṭwār should arrive here, and not be killed in some clever way (beforehand), then it might injure my son Ta-shis-nam-gyal's rule (over Pu-rig)"—So without the knowledge of the authorities at Ladakh, a servant of the queen went (on his errand), and at a bridge on the frontier, between Kiṣṭwār and Paldar, the servant approaching the king in the manner of one who has a petition, threw the king into the water. The fatal rumour soon spread all over the country.

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[1] Near the Leh-bridge over the Indus. It is generally asserted that it was built by the Mongols, which is an error.

[2] A district in the south of Tibet proper, near Sikkim.

Although Ṭa-shis-nam-gyal and the elder son Sa-skyang ought to have been made Lords of the Palace, the younger brother P'un-ts'ogs-nam gyal, through treachery of his mother, made him (Sa-skyang) Lama at Hemi (XXVII) *P'un-ts'ogs-nam-gyal* reigned; but his uncle Ṭá-shis-nam-gyal tyrrannized the Kashmīr traders and his Ladakh subjects From this resulted a quarrel as to who really had the power. Now this state of things was reported to the Dalai Lama, *viz*, that a disturbance with the frontier king had arisen, and that this might be made an occasion for an Indian army to 'break out.' At that indentical time, just when he was in contemplation as to whom amongst the Ḳar-gyud-pa Lamas he should give the order to act as peace-maker, it happened that the great Ka-tóg[1] Rig-dzin[2] Tśe-wang-nor-bu arrived from Kamś on his way (to Nepāl), where he intended to exchange the Wood of Life on the great Chorten of Nepāl. The Gyalwa-Omniscient sent word to the Great Rig-dzin. "You should undertake to go and make peace in Ladakh". He, magnifying openly the word of the Gyalwa, promised to go to Ladakh. He arrived at Gar There, following the suggestion of king Ṭa-shis-nam-gyal and his ministers, the Lord Chamberlain and the Lonpas from Zangskar and Ḍang-skar attended. They had been sent to meet the Saviour, the Great Rig-dzin They explained to him the condition of Upper and Lower Ladakh Thereupon he arrived with messengers of the two Gar-spon at Wamle Lamasery. There he and the king and ministers of Ladakh met. In time also the king and ministers of Purig arrived, and the proceedings began They all agreed to the decisions and obligations imposed upon them by the Saviour, the Great Rig-dzin The results arrived at through these deliberations were "Whatever the number of sons born at Ladakh-Kár may be, the eldest only shall reign The younger ones shall become Lamas at Spe-t'ub, Tis-tse, etc, but there shall be no two kings. The king of Zangs-kar, being (?) at the frontier against Hindūstān, shall remain king as before The He-na-ku (rulers), obviously being of royal descent, and their kingdom of little importance, shall also remain as before With these two exceptions it shall not be permitted that in one kingdom exist two kings" In accordance with these decisions the son (XXVIII) *Ts'e wang-nam-gyal* was elected king P'un-ts'ogs-nam-gyal, mother and son equally divided the property in Le-k'ar and appropriated it They afterwards resided at Ser-ṭ'i-k'ar (Bang-k'a). Sa-skyang entered at Hemi the order of the Rig-pa-dzin-pa and the queen Kun-zoru bore (him ?) a son Skyab-gon-gyal-skas-mi-p'am-t'se-wang-ṭ'in-los. Clerical authority increased. Another son was born, and became very clever in medicine, he went to Lhasa. There (also) was a daughter She was taken to Tibet as a wife of a Hor-k'ang-sar[3] The king Ta-shis-nam-gyal, as long as he lived, remained ruler of Purig Afterwards it was united with Ladakh

By this settlement and agreement all the noblemen and the council of elders[4] and merchants first, but the whole empire as well, were rendered happy and contented. The princes were reconciled, and Lamas and Lords (? the highest Lords) went to Shal-k'ar.

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[1] District in Tibet.

[2] Name of the order of married Lamas.

[3] Name of an important family at Lha-sa

[4] The lowest grade of councillors to the king in Ladakh polity The 'Council of Elders' consisted of about 3 or 4 persons of some standing and experience,

At that time messengers of the Nawwāb of Kāçmīr arrived with the request, that the Abhit'ang should be cleared of water. On the occasion when the messengers had their audience, through a blessing, from one silver tea-pot tea was poured out to all the men who took part in the banquet. The messengers believed and went home.

After that, the great Rig-dzin deposited one copy of the settlement at Lel-k'ar, one at Mul-bhe-kar, one in Zangs-k'ar, and one in Hemis Lamasery, and thereupon he again returned to Bod.

Later on a wife was sought for Ts'e-wang-nam-gyal from Zang-la-k'ar.[1] About that time it happened that the Evil One entered the king's mind, and giving way to the influence of bad servants, he took a Bhe-mo[2] to his royal chambers. The Zang-la queen consequently returned to Zang-la and became the wife of the king of Zangs-k'ar. His doings were not as before, unusual and strange, and he had for 500 horses one groom each, and a lamp (at night) in grander style, the horses' feet and genitals, (?), etc, were paid much attention to. The princes, (nobles) and the people could not endure such doings (for long), and once when the king, through his royal prestige, made the taxes payable by the people three times (in one year), they dismissed the Stok-ka-lon[3] office and evicted the Bhemo. Then they asked Bhe-k'yim-wangmo of Sod[4] to become queen. She had three daughters and two sons. The name of the elder son was Lha-ch'en-mi-gyur-ts'e-stan-nam-gyal, of the younger one, Ts'e-pal-mi-gyur-don-dub-nam-gyal. The lesser queen K'a-t'un-ts'e-ring had one son, Jigs-med-nam-gyal. Then the king died. As the sons were yet minors, the Hemi-Sku-cho'g took counsel with the princes and the nobles, and asked on behalf of the prince (XXIX) *Ts'e-stan-nam-gyal* for a queen at Pal-k'yum-k'ar[5] in Purig. The prince Don-dub became Lama at Hemis. The son of K'a-t'un-ts'e-ring became Lama at T'i-tse. One daughter was given in marriage at Pal-k'yum-k'ar, another to Ka-lon-Ts'e-wang-don-dub, the

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especially elected. The 2nd grade were the hereditary Lon pos, also a small number, the 1st grade, the Ka lons, likewise 4 or 5 only, and also hereditary.

[1] In Zangsk'ar. Drew's map Zang-la.

[2] A woman of the lowest cast, Muhammadan, *masc* Bhe da. According to manuscript O she was from Tsang-ra (in Pu rig).

[3] Stok, village opposite Leh, south of the Indus. The king of Ladakh usually resides at Stok, where he has a fine palace, which he keeps in excellent repair. To this palace the king seems to have taken the Bhe-mo, and the Ka-lon probably connived.

[4] In Pu-rig.

[5] Near Kargil.

third went and stayed as ? ?. Afterwards, when the king, Ts'e-wang-(stan)* nam-gyal was grown up, his personal appearance was like that of a Lha. He was diligent and obtained proficiency in Tibetan grammar and mathematics, Persian letters and speech, Kāçmīr speech, and other such languages.[1] In memory of his father he built the Kyin-maṅi-ring-mo[2] with Chortens at either end of the great Nam-gyal and the Jang-ch'ub types. He also knew well how to govern. But in a neighbouring district some "defect" became apparent, and in consequence of want of merit in the people an epidemic of small-pox broke out, and he died in his 24th year at Kar-zu[3] Then the Ḍug-pa Omniscient Kun-zigs-ch'os-kyi-nang-wa[4], being present at Hemi Lamasery, performed the funeral rites in grand style.

Thereupon (XXX) *Ts'e-pal-mi-gyur-don-ḍub-nam-gyal* of Hemi was induced to turn layman, and was invested with royal power, and administered his kingdom, after having in common with the former as wife the Pal-kyum lady. During Ts'e-stan-nam-gyal's lifetime one daughter was born. With this king a daughter Bhil-ch'ung, and a prince Ts'e-wang-rab-stan-nam-gyal were born Through the activity of the Kalon T'se-wang-don-dub provinces and frontiers, everybody living in affluence, and works that were all and one on the side of virtue, enjoyed peace and happiness Then, at one time, some deleterious influence took possession of the king's mind All the servants in his presence were upstarts, and with them he took counsel In the country many fields and houses 'went wrong' In judgment also he regarded (the face of) riches and of men. The private servants in the palace also had to promise daily not to sleep at night. The king also did not sleep at night He rose when the sun grew hot In the morning when washing his hands, he required 413 buckets[5] (?) full of cold and hot water mixed to wash his hands. When he travelled about in the provinces, he went at night with lamps and torches (?). With the men of the old régime he could not agree. He took the Privy Seal from the Kalon to the palace The king himself, and the head-men of villages, Lords, etc, all new-fashioned men, took counsel with each other. The noble families he did not attend to The king of Zangs-k'ar and the Pu-rig Ka-lon he kept in prison. The new-fashioned servants that stood before him he made governors of the palace, and everywhere the old customs were destroyed • •

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[1] Manuscript C adds he was devout and knew well the duties of kings. Before the enemy he was fearless His solicitude for the welfare of his people was (exceedingly) great Between himself and another he saw no difference As there, thus far, had been no principle regulating taxes and revenue, he (made a rule) that henceforth taxes should be raised only (in accordance with the income), measure for measure

[2] Opposite Leh At its foot is the Muhammadan grave-yard

[3] Now the British Joint Commissioner's compound (at Leh)

[4] According to manuscript C king Ts'e-stan-nam gyal in his lifetime had made him, when he came to Hemis, a present of 50 ponies, 50 yak-bulls and cows, 1,000 goats and sheep, 25 ingots of silver, 3,000 Nānak-Shāhī Rupees, 100 Zhos of gold one string of coral-beads, 15 pieces of brocade, 1 piece of red broadcloth, 1 piece of yellow (broadcloth), 25 pieces of calico, 25 pieces of silk taffeta (handkerchiefs ?), etc

[5] According to manuscript C 12 or 13 basins.

At that time, having passed through Nyungti and Gar-zha, the Baṛā Ṣāhib and the Chōṭā Ṣāhib, with great wealth, came to Leh They gave all sorts of rich presents to the noblemen of Ladakh and others. "We must see the king" they said, "what evil there is in Indians, one cannot know," was all that was said in reply, and an audience for consultation was refused for several months At last they saw the king They presented a pen-knife, scissors, a gun, and a variety of things, but the best were a pen-knife, scissors and a gun. They said "We have come to see the way in which your ministers and people are 'carrying it on,' and your Majesty's wisdom, and as there is a likelihood of this country being conquered, if we built a tower (fort) here, it would prove useful to the king" The king and ministers, in considering the case, said "If they build a fort, no one knows, what means of doing harm it may be," and did not allow them to build the fort Then they gave him (the king) a letter in a box and said "Accept this, it may cure the king's mind!" They stayed through both summer and winter and then departed. These were the first European Ṣāhibs who came.

Thereupon the army of Nyung-ti invaded Spi-ti and after having destroyed the villages and carried away all the property, they returned home. They petitioned (the king) that he should wage a war of revenge, but he said "You have not tried your best," and punished them

Later on, the Nyung-ti and Gar-zha conspired against Zangs-k'ar, and laid waste Pal-dum-k'ar and the central districts. The symbols of Body, Word and Spirit they destroyed Ponies and Yaks, whatever there was of mammon, they robbed, and again returned home. Later on, Paldar brought the Sher army of Ratanpas (?). From A-ring to Pa-dum every village they destroyed Throughout Kar-sha and the central districts, on both sides of the river, they fought, and although afterwards a peace was made and they went back, yet the king said: "You Zangs-kar people have not tried your best," and punished them. One year later a Man-ḍe and Wa-ran army came and devastated Upper Zangs-k'ar up to Dung-ring They burnt the villages with fire, what of wealth and cattle they got they carried back with them.

But he (the king) did neither see nor perceive, and he never asked whether they fared well or ill; he took interest in what concerned his own pocket only. At that time that treasure (?) (had increased so much) that it was beyond redressing. The king as a memorial for himself built the new palace of Stok. At the Kar-zru at Leh he built a palace and a K'a-t'un-bhan — — (?). The queen sent a messenger to Tibet to ask for a wife for her — (?) prince from there. He addressed himself to the Sde-pa at Lha-gya-ri. The same intended to make it her (his) residence, and therefore built at Leh the new palace above the Lamasery of Chan-ras-zigs. In the end, however, through some misfortune happening in Tibet, the Lha-ri girl could never be asked to come here. The king erected an image of his own patron deity, Ch'ag-na-ḍorje, in size like the king himself, made of timber of gold-willow up to the throat, that was of silver. He also erected a Chorten of silver, adorned with copper and gold and precious stones, one story high.

In the Water-tiger year (1782) he erected in the Upper Banquetting Hall an image of the Guru Padma-od-bar, made of 13 maunds of silver. In Shel he erected a Ts'e-pag-med, out of 7 maunds of silver. At Stok palace he erected an image of the queen White Ḍolma Kar (?) out of 9 maunds of silver.

Then after a while in the Wood-ox year (1805) the Master of Perfect Insight, Yang-dzin-nga-pa, realized that the prince was an incarnation of the Hemi Sku-ch'og Bhil-wa dorje, [or · the Yang-dzin-nga-pa, said, "that the prince was etc."; after having obtained perfect insight he cared only for himself] he then stayed at both Hemi and T'eg-ch'og. Having thus become so important a personage, he found it difficult to obey father and mother. The queen travelled in Nubra, Purig and Ladakh, never remaining at one and the same place. She also asked the prince to join her and took him with her. 'It is for the prince's amusement,' she said, and they passed their time, both day and night, with dancing and singing. What the king said, he did not account for much, but he listened to what the queen's own steward, Sod-nam-wang-ch'ug, told him. The prince Ch'og-skul took their part.

The king and ministers and others for some time had attempted to induce him for the sake of the dynasty to marry, but he would not. He replied "I have to be at Hemi," and would not relent. But as there was no other son, the king, minister, lords, council of elders, and the steward of the twin (reciprocal) Lamaseries, Dub-ch'en-a-tsar, and others, making intercession, and in order to preserve the dynasty, he (consented and) married the younger daughter of the Ka-lan T'se-wang-don-ḍub, Skal-zang-ḍol-ma by name. Before one year had elapsed the princess conceived He afterwards married yet another lady, the T'sun-mo Pal-Kyid of Pal-kyum, and yet a third, Zora-k'a-t'un. It was in the Water-horse year (1822) that he took these three wives, and it was in the same Water-horse year also, that the king of Jammū's, Gulāb Singh's Wazīr, Zōrāwar, with some Ra-ya-si-yi, arrived in Kar-t'se. The Ladakh captain and army were sent. At Kar-tse they met and three engagements ensued, in which many sipoys were killed. Immediately a report was sent in (giving an account) of how matters stood, but the king and dowager-queen only replied: "If you don't do your best, you will be censured!" (or If you do your best, you will not be censured!) kind words they gave none ("We will be gracious," they could not prevail upon themselves to say). Now as there was much snow in Pu-rig, and the Indians not accustomed to the cold, the Wazīr changed his mind and sent a messenger to the captain to say "If you will give to the Mahārāja Gulāb Singh a present of about 10,000 Rupees, we will make peace and go back." Upon this the Ladakh Lon-po and captain of the army took council and they sent in a petition worded thus "If the king should be kind enough to give this money, then his kindness really would betray true solicitude for his people. If not, then truly every one of the soldiers, as so many chickens (?) are assembled here, and stand praying before him (? and beg) that peace be made" The king also received (this message) graciously. He gave command that the sum should be paid from the Ka-wa-chu-pa treasury, but the queen's influence being the greater (the queen's counsel prevailing over his), it was impossible He instead sent a rescript saying "We do not see fit to give the money, and unless you bring Zōrāwar's head, neither head, nor life, nor fields, houses, property, or food will be left to you!" (When) the captains and soldiers (heard this message), their courage fell (heart failed them) Although they continued to fight, yet it was only a half-hearted sort of business The captains also did no longer agree When the next engagement came off, the Ya-ra-?-nu with 500 sipoys attacked the right wing of the Ladakh army On the left wing the Ladakh men felt dejected and did not stir A surprise force suddenly appeared on the scene and broke into their ranks So the soldiers of all fled in confusion. The Stok Ka-lon, 18 years of age, who was at the head of the army, was shot by an unlooked-for arrow and died The other head-captain Gyur-med and the Lonpo of Nubra survived Now also the Leh-Lonpo Ngos-ḍub-standzin, who commanded the right wing, gave way After this, those of the nobility who had formerly been kept in prison by the king turned traitors. Showing the Wazīr the way they reached Basgo. The king also went there and they met. Although the Wazīr made it conditional that 20 horsemen should come into Leh, yet altogether, though singly, about a hundred came Having stayed there for seven days, during which time he also met the prince Ch'og-sḳul, they came to a mutual agreement, that to the Government the money should be paid as a present. Then they returned.

But the queen and the Bang ka-pa (again played him foul) and did not pay the money. Their plan was to send an army in his rear, whilst he was still on his way back. But the Wazīr heard of this treachery By way of Rang-dum, Zangs-k'ar, and Gya he (suddenly) returned The prince and queen fled, they passed through Ḍang-ts'e The greater queen, having just been delivered of a son, was left behind in Shel-k'ar, but the two lesser queens went with the prince. By way of Wam-le they safely reached Spi-ti.

Abstract of the Contents of one of the Āhōm Puthis, By E. A. Gait, C S

Although, it is well known that the Āhōms, the Shān invaders of Assam, who obtained a foothold in the eastern extremity of the Brāhmaputra valley about the beginning of the 13th century, brought with them from the valley of the Irawadi a written character [1] and a literature of their own, very little has hitherto been done in the direction of examining their records, or of obtaining an insight into their traditions This is the more to be regretted in that the language, as a spoken one, has practically disappeared, and the knowledge of it is now confined to a few families of Dēōdhāis (priests) and Bāilongs (astrologers), who still retain a lingering belief in the form of worship which was professed by their race before they fell under the influence of Çākta priests, and abandoned their national language and religion for that of the Hindūs whom they had subjugated [2] An examination of their historical writings is said to have been made by the late Kāçīnāth Tāmulī Phukan, in connection with the Assam history, or *Buranji*, which was published in 1844 at the Baptist Mission Press, Sibsāgar, under the auspices of Purandar Singh, the last of the Āhōm Rājas, but none of the purely social or religious writings have, so far as I am aware, ever been noticed

These writings, or *puthis*, are all inscribed on oblong strips of

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[1] The character is derived from the Pālī, and is said by Forbes to resemble the Mōn rather than the Cambodian type

[2] For the past twenty years even these sections of the Āhōms have been taking Gōsāīns, the alleged reason being that all their countrymen have become orthodox Hindūs, and refuse to associate with them unless they also conform outwardly to the same religion But they assert that their faith in Indra remains as strong as ever, and that they still make him offerings of ducks, goats, fowls, &c. Any educated person was capable of becoming a *bailong*, but the office of *Dēōdhāī* was hereditary. In the days of Āhōm rule, the heads of the *dēōdhāis* were sacred, and they were exempted from the liability to pay revenue Some of them still possess small *nisfkhirāj* estates. They are still called in to tell omens, but for no other purpose.

Sācī bark,[1] which are written over on both sides, and are protected at the ends by somewhat thicker strips of the same material. They are very carefully preserved, wrapped up in pieces of cloth, and every family of the two sections mentioned above, is in possession of a certain number, which are handed down from father to son The labour of preparing the bark and of inscribing the writing is considerable, and apart from this, much greater value is attached to an old *puthi* than to a new copy of it New copies were therefore very seldom made, and in any case, it is very many years since the copies in possession of the modern representatives of the old priests and astrologers were prepared I saw a number of these *puthis* recently when in Sibsāgar, some of them were black with age, and the characters had in places almost disappeared The owners set great store by them, and my efforts to become the purchaser of one of them were altogether fruitless But although they will not sell them, they are quite ready to communicate their contents My time was limited, and I was only able to make a few rough notes of two The first described Cukāphā's invasion of Assam, about 1228 A D , and agreed in the main with the account given in Kāçināth's *buranji* , the second dealt with the creation, and a short notice of the order of events, as there narrated, is reproduced below

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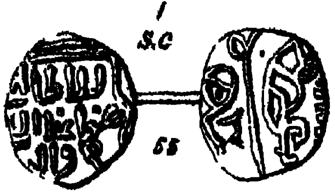
[1] The *Sācī* tree is the same as that known in Bengal as *Agar* (Aquilaria Agallocha), the Aloes wood of the Bible, from which are obtained the perfumed chips which are so largely exported from Sylhet for use as incense in temples, &c Although its bark was widely used as a writing material throughout Assam, prior to the introduction of paper, its employment as such seems to have escaped notice The following description of the manner of preparing the bark for this purpose for which I am indebted to Bābū Phani Dhar Chaliha, of Sibsāgar, may therefore be found interesting A tree is selected of about 15 or 16 years' growth and 30 to 35 inches in girth, measured about 4 feet from the ground From this the bark is removed in strips, from 6 to 18 feet long, and from 3 to 27 inches in breadth These strips are rolled up separately with the inner or white part of the bark outwards, and the outer or green part inside, and are dried in the sun for several days They are then rubbed by hand on a board, or some other hard substance, so as to facilitate the removal of the outer or scaly portion of the bark After this, they are exposed to the dew for one night, and next morning the outer layer of the bark (निकफिट) is carefully removed, and the bark proper is cut into pieces of a convenient size, 9 to 27 inches long and 3 to 18 inches broad. These are put into cold water for about an hour and the alkali is extracted, after which the surface is scraped smooth with a knife They are then dried in the sun for half an hour, and when perfectly dry are rubbed with a piece of burnt brick A paste prepared from *mātimāh* (Phaseolus aconitifolius) is next rubbed in, and the bark is dyed yellow by means of yellow arsenic This is followed again by sun-drying, after which the strips are rubbed as smooth as marble. The process is now complete, and the strips are ready for use.

I hope in time to be able to give a similar account of some of the folk-lore locked up in other *puthis*. Some educated Assamese gentlemen in Sibsāgar are taking a tardy, but none the less welcome, interest in these relics of a bygone age, and it is to be hoped that their efforts will culminate in some tangible result. As a preparatory step, a register is being prepared, showing the *puthis* in the possession of each family, with a short abstract of the subjects dealt with. When this register has been completed, it will be possible to take steps to procure more detailed information regarding the contents of each *puthi*.

THE ĀHŌM STORY OF THE FLOOD

Once upon a time, there was intense heat from the sun, which dried up all the water on the face of the earth, so that many people died of thirst At length the intense heat caused the earth to crack, and an immense volume of boiling water flowed out and killed all remaining living things, except an old man named Thāolīpling, and a cow, who were in a boat made of stone As the waters rose, this boat was carried by the flood to the summit of a high mountain, the name of which is Ibā, which lies far away to the North-East. The old man and the cow stayed on this mountain, while the water gradually subsided, leaving the bodies of the dead men and animals to decay From them, such an evil smell arose, that it reached the abode of the Gods, who sent fire down from heaven to burn them The heat caused by the conflagration was so intense, that the old man, being unable to endure it, killed the cow and took refuge inside its body There he found the seed of a pumpkin When the fire had died away, he planted this seed, and a tree grew up which threw out four branches in the direction of the four points of the compass The northern branch was killed by the cold, the southern branch fell into the fire and died, the western branch was destroyed by the remains of the flood, and only the eastern branch remained This branch grew and flourished exceedingly, and at last produced a giant gourd, inside of which were men, and every kind of animal, bird and fish, and every kind of plant The living creatures tried hard to get out, and at length their cries and struggles reached the ears of Indra, who sent a messenger, named Pānthoi, to ascertain what was inside the gourd. Pānthoi went and listened, and heard the cries of men, cattle, elephants, and all sorts of animals He returned and reported this to Indra, who sent his eldest son Āiphālān to break open the gourd with a flash of lighting Āiphālān descended to earth to carry out his father's instructions, and at first aimed at the point of the gourd where the men were The men however implored him to aim elsewhere, and entreated him not to destroy them, saying that if they were only allowed to live and to escape from the gourd, they would settle down and cultivate. Āiphālān then aimed at the place where the cattle were, but they likewise begged to be spared, saying that they would be required by the men for ploughing. Indra's son again changed the direction of his aim, but was again met by entreaties to discharge his fiery missile at some other part of the gourd. At last, the old man Thāolīpling, who was sitting at the point where the flower had died off from the gourd, offered to sacrifice himself for the men if they agreed first to feed him, and promised to worship him ever afterwards. This they did, and Āiphālān thereupon discharged the lightning towards the part of the gourd on which the old man was sitting. Thāolīpling was killed, but the gourd was split open and everything inside it escaped. Āiphālān then taught the men different occupations. He also taught the birds how to build their nests, and the other animals how to support themselves.

Thāolīpling is still worshipped by the Dēōdhāīs, who make him offerings of sweets, grain, &c. Indra is their main and supreme God, but this does not prevent their also doing homage to the man, but for whose act of self abnegation the gourd might have remained unbroken until the present day.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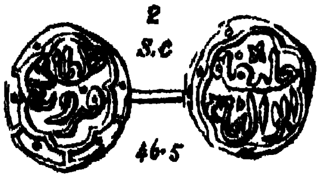
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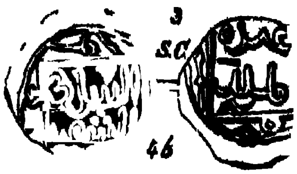
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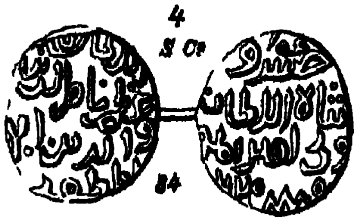
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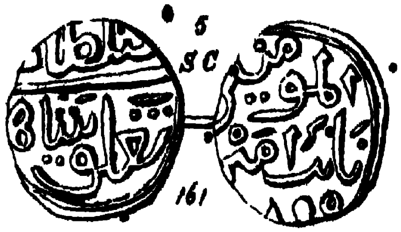
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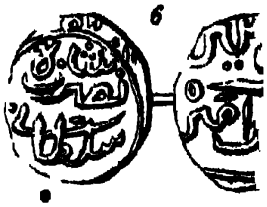
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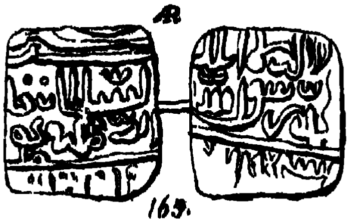
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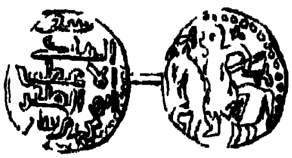
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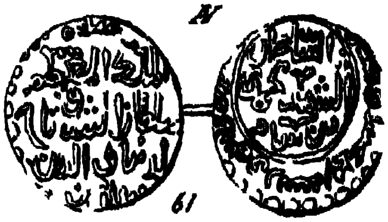
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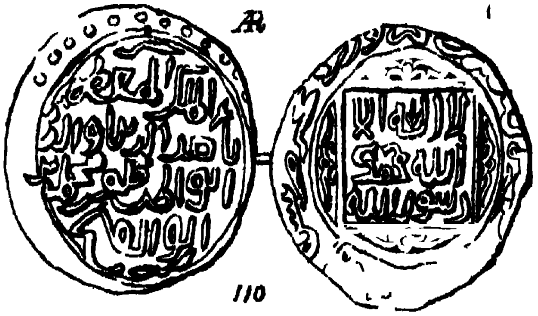
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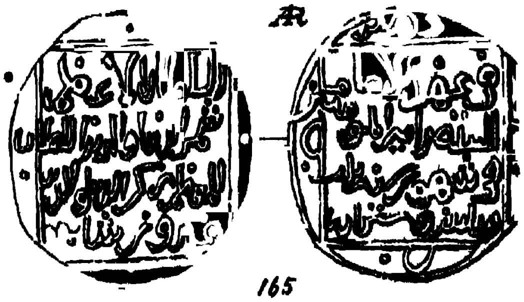
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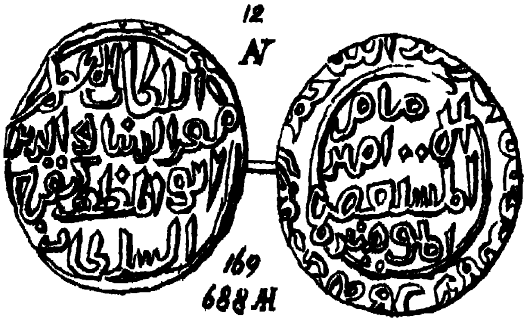
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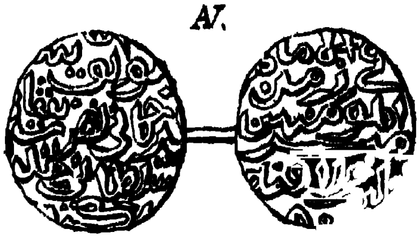
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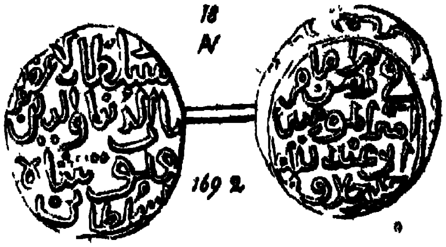
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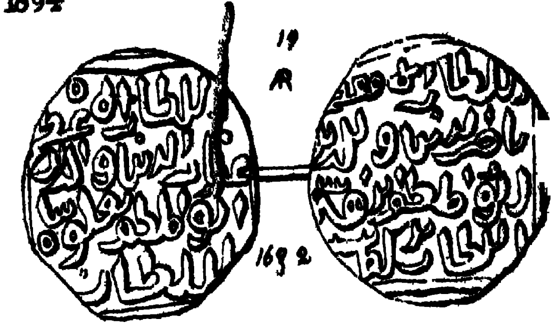
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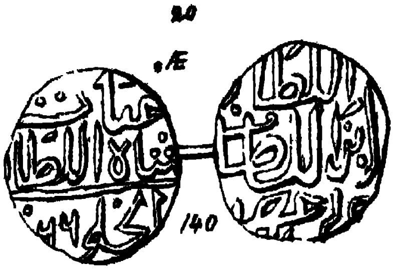
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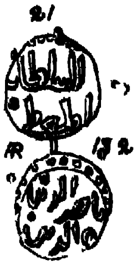
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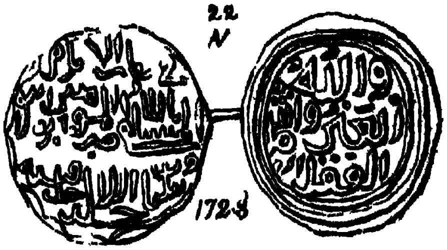
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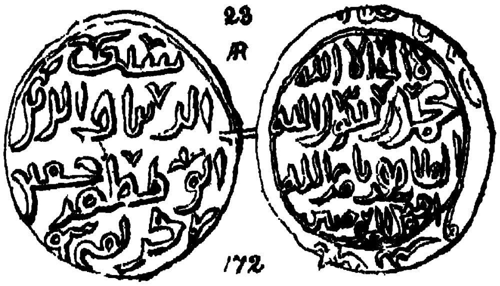
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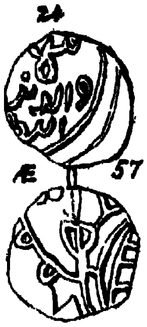
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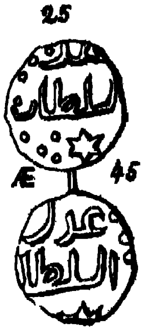
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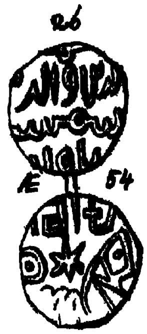
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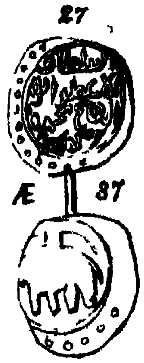
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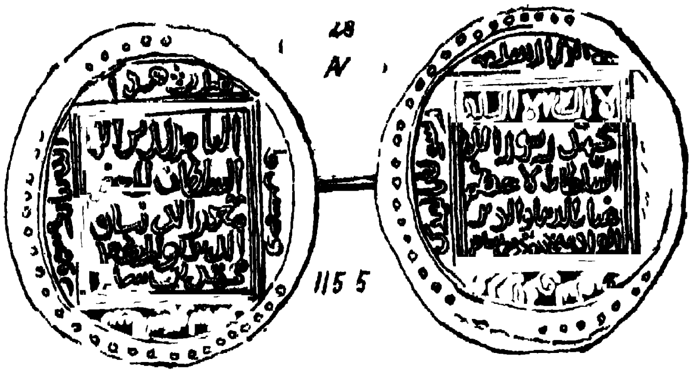
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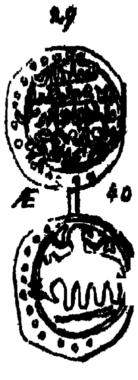
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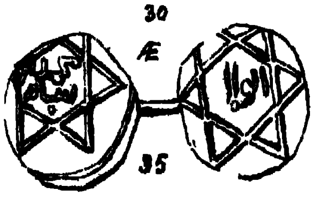
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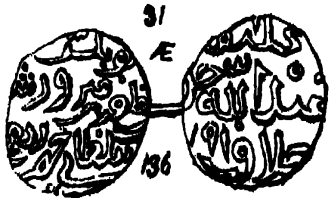
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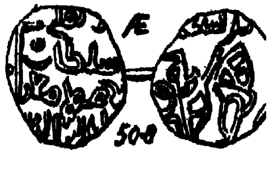
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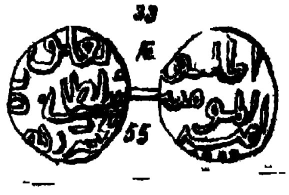
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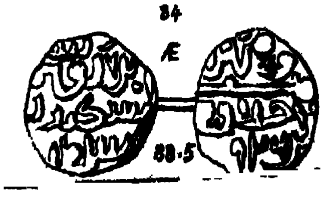
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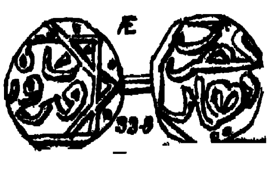
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Under orders of the Council the following system of transliteration will be adopted for the future in all publications of the Society Authors of papers for the *Journal*, Pt. I, are particularly requested to adhere to it in their contributions.

A. FOR THE DĒVANĀGARĪ ALPHABET, AND FOR ALL ALPHABETS RELATED TO IT

अ *a*, आ *ā*, इ *i*, ई *ī*, उ *u*, ऊ *ū*, ऋ *ṛ*, ॠ *ṝ*, ऌ *ḷ*, ए *e*, ए *ē*,
ओ *o*, ओ *ō*, ऐ *ai*, औ *au*, ं *ṁ*, ँ ˜ ः *ḥ*

क *k*,	ख *kh*,	ग *g*,	घ *gh*,	ङ *ṅ*
च *c*,	छ *ch*,	ज *j*,	झ *jh*,	ञ *ñ*
ट *ṭ*,	ठ *ṭh*,	ड *ḍ*,	ढ *ḍh*,	ण *ṇ*
त *t*,	थ *th*,	द *d*.	ध *dh*,	न *n*
प *p*,	फ *ph*,	ब *b*,	भ *bh*,	म *m*
य *y*,	र *r*,	ल *l*,	व *v*,	(ळ *ḷ*)
श *ç*,	ष *ṣ*,	स *s*,	ह *h*	

* In the above the *virāma* has been omitted for the sake of clearness.

In Modern Vernaculars only; ड़ may be represented by *ṛ*, and ढ़ by *ṛh*.

Avagraha is to be represented by an apostrophe, thus सो ऽपि *sō 'pi* *Visarga* is represented by *ḥ*, *Jihvāmūlīya* by *ẖ*, and *Upadhmānīya* by *ḫ* *Anusvāra* is represented by *ṁ*, thus संसर्ग *saṁsarga*, and *anunāsika* by the sign ˜ over the letter nasalized, thus अँ *ã*, आँ *ā̃*, and so on. The *udātta* accent is represented by the sign ´ and the *svarita* by ˆ. Thus, अग्निः *agníḥ*, जनिता *janitā́*, क्व *kvā̂*, कन्या *kanyā̂* The *anudātta* accent may be represented by ˋ. Thus, ते ऽवर्धन्त *tè àvardhanta*

B. FOR PERSIAN (INCLUDING ARABIC WORDS IN PERSIAN) AND HINDŪSTĀNĪ.

(The system is not applicable to Arabic when pronounced as in Arabic-speaking countries) :—

Vowels.		Consonants.		Sounds only found in Hindūstānī.	
ا	a	ب	b	بھ	bh
آ	ā	پ	p	پھ	ph
اِ	i	ت	t	تھ	th
اِی	ī			ٹ	ṭ
اے	ē			ٹھ	ṭh
اُ	u	ث	s		
اُو	ū	ج	j	جھ	jh
او	ō	چ	c	چھ	ch

Vowels.		Consonants.		Sounds only found in Hindūstānī.	
اَیْ	ai	ح	h		
اَوْ	au	خ	kh̲		
		د	d	دھ	dh
				ڈ	d
				ڈھ	ḍh
		ذ	z		
		ر	r	ڑ	ṛ
				ڑھ	ṛh
		ز	z		
		ژ	zh̲		
		س	s		
		ش	sh̲		
		ص	ṣ		
		ض	ẓ		
		ط	t		
		ظ	z		
		ع	ʻ		
		غ	gh̲		
		ف	f		
		ق	q		
		ک	k	کھ	kh
		گ	g	گھ	gh
		ل	l		
		م	m		
		ن	n		
		ں	when representing *anunāsika* in Dēva Nāgarī, by ˜ on the preceding vowel		
		و	w (or rarely v)		
		ہ	h		
		ی	y		
		Hamzah ء	(where necessary) '		

The ل of the article ال in Arabic words should be assimilated before the solar letters, and the vowel *u* which often precedes the article and absorbs its vowel should remain attached to the word to which it belongs Thus—اقبال الدولہ Iqbālu-d-daulah.

Tanwīn may be rendered by n̲—e. g., *ittifāqan̲* *Alif-i maqsūrah* should be rendered by *ā*.

Final ة need not be written in Persian and Hindūstānī words, but should be written in Arabic words

"Pimp! Pimp!" Now, as Islām K͟hān was following his prisoner on another elephant, Rustam Dil K͟hān retorted unabashed, "Which do you mean? The pimp in front or the one behind?" His office of *Mīr Tōzak* was given to another man, and 'Ināyatullah K͟hān, the Khānsāman, or Lord Steward, was directed to confiscate his property. The amount reported was 500 gold coins (*asharfī*) 1,36,000 rupees, 11 elephants, 70 horses, 18 camels, some jewels, and forty cart-loads of tents. After a few months the culprit was released, and received the name of G͟hazanfar K͟hān in place of his old titles (20th S͟hawwāl, 1123 = 30th November, 1711).[1]

On the 14th Ẕū,l Hajj, 1123 (22nd January, 1712), barely a month before Bahādur S͟hāh's death, Muḥammad Amīn K͟hān reported a severe fight with the Sikhs, and with his letter he sent in five hundred heads. But, on the Emperor's death, Muhammad Amīn K͟hān left that part of the country and returned to the imperial camp with the object of taking part in the fight for the succession. The Guru saw his opportunity and, once more took possession of the town of Sādhaurā, and restored the fort of Lōhgarh. Here he remained undisturbed for about two months. When Jahāndār S͟hāh's accession had taken place, Muḥammad Amīn K͟hān was sent back to continue the campaign, and Zainu-d-dīn Aḥmad K͟hān, faujdār of *Chaklā* Sirhind, was ordered to put himself under that general's orders. For several months the investment of Sādhaurā was maintained without result. Then, towards the end of the year 1124 (December, 1712), when Jahāndār S͟hāh left Dihlī for Āgrā to oppose the advance of Farruk͟h Siyar, he recalled Muḥammad Amīn K͟hān to head-quarters. Subsequent events will fall within the reign of Farruk͟h Siyar.[2]

[NOTE.—Another extract relating the capture and execution of Bandah, and giving an account of the Sikh spiritual succession up to 1173 H., has already appeared in the *Asiatic Quarterly Review* for April, 1894, pp. 420–431.]

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[1] Kāmwar K͟hān, 95, 98, and Dastūr ul-'Aml, B. M., Oriental MSS., 1690, fol. 155b.

[2] Kāmwar K͟hān, 100, Mirzā Muḥammad, 215–237.

On the Hypothesis of the Babylonian Origin of the so-called Lunar Zodiac—

By G THIBAUT.

That the lunar zodiac, or system of lunar mansions, which we find in use since an early time among several Asiatic nations, notably the Arabs, Hindus and Chinese, had originally been established in Babylon, was a conjecture, first thrown out by Professor A Weber.[1] Direct proofs of such a zodiac having been recognised by the Chaldean astronomers were, indeed, not given by that scholar A few facts were quoted which seemed to lend some countenance to the hypothesis in question, but that these facts had by themselves little proving force was admitted by the author of the hypothesis himself That, under these circumstances, the hypothesis was put forth at all, was due to the conviction that the striking similarities displayed by the lunar zodiacs of the three nations mentioned, could be satisfactorily accounted for, only on the assumption of there having been a true historical connexion between them, while, at the same time, difficulties of various kinds seemed to preclude the assumption of the zodiac having been first devised by one of the three nations, and later on, borrowed by the other two. It thus presented itself as a not unlikely way out of the difficulty, to assign the invention of the lunar zodiac to the centrally situated Babylon, which, moreover, was known to have been one of the earliest seats of astronomical observation and speculation, and to suppose that from thence were derived at a very early period the different lunar zodiacs positively known to us

Viewed in this way, the hypothesis was indeed by no means destitute of plausibility. It did not enter into conflict with any known facts, and seemed to offer openings for the removal of certain difficulties which attached themselves to other theories Hence it was, if not adopted, at least referred to as not improbable by several competent enquirers. That others again, less cautious, and perhaps less fully acquainted with the intricate character of the evidence, proceeded to state as an undoubted fact, what certainly was only a fairly plausible conjecture, was what generally happens in such cases, and can in no way be laid to the fault of the distinguished author of the hypothesis

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[1] See Weber's History of Indian Literature (first German Edition, 1852, p. 21), and the first of his Essays on the Nakshatras, 1860, *passim*.

At the time when Professor Weber first formulated his views on the probable origin of the Nakshatras (to use the term by which the Hindus designate the constituent asterisms of their lunar zodiac), hardly anything was known about the astronomical doctrines of the Babylonians, but what we learn from Greek and Roman authors These writers do not indeed say anything about a lunar zodiac, but as their accounts cannot be considered as in any way exhaustive, no great stress could be laid upon this absence of testimony on a particular point. During the last forty years, however, rapid progress has been made in the decipherment of the original records of Babylonian and Assyrian literature, *i.e*, the very numerous inscriptions in cuneiform characters engraved on stone and clay tablets, which have been excavated from the heaps of ruins covering ancient Chaldean soil, and are at present preserved in the great Museums of Europe, principally the British Museum Among these records of the past, numerous texts of astronomical and astrological character came to light, some of which have been published—chiefly in the 'Inscriptions of Western Asia,' edited by the authorities of the British Museum,—and several scholars, soon after, attempted to elucidate the meaning of those difficult documents Of the scope and value of these earlier attempts to re-construct the system of Chaldean astronomy we cannot speak here in detail. To the general difficulties besetting all interpretation of cuneiform documents, there are added, in the case of astronomical texts, special difficulties of a truly formidable nature, and we, therefore, need not be astonished, when finding, that, for some time, no results were reached that could be accepted with any confidence As far as the question of the lunar zodiac is concerned, nothing was discovered that favoured the hypothesis of its Chaldean origin But owing to the fragmentary nature of the texts interpreted, and the doubts attaching to the interpretations, there was, after all, no reason for giving up the hope that evidence confirming that hypothesis might be traced at some future time

A few years ago, however, an enormous advance in our knowledge of Babylonian Astronomy was effected by the publication of the results of the researches which two distinguished scholars, Fathers Epping and Strassmaier, had carried on in co-operation.[1] F Strassmaier had succeeded in discovering, among the treasures of the British Museum, some astronomical tablets which were distinguished from the mass of similar documents by being clearly dated in a known era, so that astronomical calculation could be resorted to for the interpretation of their contents I cannot, interesting as it would be, give in this place an account of the steps by which F Epping, throughout assisted by the vast philological and palæographic learning of F. Strassmaier, arrived at a convincing and almost complete interpretation of the contents of those tablets, how, by calculations and reflections continued through many years, he succeeded in eliminating one unknown quantity after the other; and thus in the end establishing a firm basis for all future research in this field Nor can I here undertake to give a full account of the nature of the results worked out Of these so much only will be concisely stated as may be considered to bear on the question treated of in this paper

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[1] F Epping S J, Astronomisches aus Babylon. Freiburg, 1889.

It appears from the astronomical tablets interpreted, that the Babylonian astronomers were in the habit of referring the positions of the five planets to a certain number of fixed stars situated near the Ecliptic The tablets explained, in the book above referred to, are supposed by Professor Epping to contain what he calls planetary ephemerids, *i e*, methodical statements of the places of the planets, as calculated before hand for a certain period of time Other tablets of a generally similar nature, which Professor Epping has since published and translated in the 'Zeitschrift fur Assyriologie,' are supposed by him to embody the results not of previous calculation but actual observation It may in some cases be difficult of decision whether a certain tablet contains a statement of calculations or of observations, for, so far, we do not know with what degree of accuracy the Babylonians either were able to predict the positions of the planets, or cared to observe and record their actual positions Professor Epping naturally supposes that, wherever the statements are very nearly accurate, *i e*, very nearly agree with the positions of the planets, as determined for that time by the methods of modern astronomy, we have to do with records not of calculation but actual observation The decision of this important question does not, however, concern us here

A few examples quoted from Professor Epping's book will serve to illustrate the Babylonian method of stating the places of planets One of the tablets says, that in the night of the 20th of the month Airu (April to May) of the year 189 of the Seleucidan Era (—122) Venus appeared (or was to appear) in the eastern sky, and above her the western star of the head of the Ram, at a distance of four yards. Again we read that in the night of the 26th of the month Abu (July to August) of the same year, Mars appeared (or was to appear) in the eastern sky, and above it the western star of the mouth of the

Twins, at the distance of eight inches. A S. O The observations—or calculations—recorded, comprise positions of all the five planets We cannot in this place dwell at length on the elaborate and ingenious processes by which F Epping succeeded in identifying the planets and the fixed stars—normal stars, as F Epping calls them—to which the places of the planets are referred, nor can we discuss the methods employed by the Babylonian astronomers in determining and expressing these places We are concerned only with the results arrived at by F. Epping, and these seem so well assured, that we need not hesitate to accept his identifications *in tôto*, so that we have trustworthy information about a number of stars—none of them far from the Ecliptic—which the Babylonian Astronomers used as their fundamental stars The planetary tables analysed in Epping's book mention twenty-eight such stars (or rather twenty-nine, if we take into account γ Cancri, mentioned in the Note to Epping's Constellation xiii, p 126) But since the publication of that book, Epping and Strassmaier have continued their researches and succeeded in explaining some further planetary tablets—constructed on much the same lines—which supply a few more normal stars, so that a list published in the December part of the *Assyriological Review* for 1892, contains altogther thirty-three normal stars Whether just so many normal stars were recognised by the Babylonian Astronomers, or whether the future decipherment of further tablets will add to that number, we are not at present able to say Taking into account that the Babylonians manifestly aimed at a considerable degree of accuracy in their observations, and possibly predictions, the former alternative would not, *a priori*, appear improbable But the fact, on the other hand, that so far, in all the Tablets explained, only thirty-three stars have been met with, while, most probably, there would have been more than once an opportunity of mentioning other stars also, seems to indicate that for some reason or other a limited number of stars had been singled out once for all, and that to them only the positions of the planets were referred. The number of these stars may, of course, have exceeded thirty-three to some extent A conjecture made by Professor Hommel with reference to this point does not lack plausibility. According to a well-known passage in Diodorus, the Chaldeans taught that thirty stars, called the 'Counsellor Gods,' were ranged under the planets,—fifteen above and fifteen below the earth—one of which went every ten days from the upper to the lower regions From the last mentioned item of doctrine, Professor Hommel concludes that we have to read, in the text of Diodorus, 'thirty-six' instead of 'thirty,' 36 × 10 being equal to 360, the approximate number of the days of the year, and seems inclined—if I rightly apprehend his meaning—to identify those thirty-six Counsellor Stars with the normal stars selected by the astronomers. This is a not unlikely conjecture, and we, therefore, may expect to meet, by and bye, in Babylonian texts, with three further stars employed as normal stars.

We now come to the special topic of the present paper, *viz.*, a critical examination of the views set forth not long ago by the distinguished Assyriologist, Professor F. Hommel, of Munich, on the connexion of the series of normal stars employed by the Chaldean Astronomers, with the lunar zodiacs acknowledged by the Arabs, Hindus, and Chinese [1]

Professor Hommel is of opinion that the results of the researches carried on by Epping and Strassmaier suffice to raise beyond doubt, the truth of the conjecture first hazarded by Professor Weber, as to Babylon having been the place where a series of lunar stations was first established, and from which that series, more or less modified, was borrowed by the other nations But as the Babylonian series on the one hand, and the series acknowledged by the Arabs, Hindus and Chinese, on the other hand, are by no means altogether identical—as indeed sufficiently appears from what has been said, so far, about the Babylonian normal stars,—there arises the necessity of accounting for the various discrepancies, and showing that they have to, or may, be viewed as later variations. We will follow Professor Hommel through the different steps of the argumentation by which he attempts to effect this.

The point in which the series of Babylonian normal stars most obviously differs from the well-known lunar zodiacs is, of course, that the latter comprise twenty-seven or twenty-eight stars, or groups of stars, while the Babylonian series numbers thirty or more stars. This discrepancy—Professor Hommel attempts to remove by undertaking to show—that the Babylonian series, as well as the lunar zodiac of the Arabs and other nations, originally comprised, all of them, twenty-four members only First, as to the Babylonian series Professor Hommel has compiled from Epping's book, a series of thirty-one stars,[2] (of which one, however, *viz*, No. 26, is not actually met with in the Tablets, but due to an hypothesis of Professor Hommel's), while, as remarked above, the list published by Epping and Strassmaier in the *Z. F. Ass* contains thirty-three stars. Strictly speaking, Professor Hommel, or any one espousing his views, would, therefore, have to show that not only the series of thirty-one stars, but also that which comprises two further stars, admits of being reduced to a series of twenty-four members The difference of the two series is, however, of no great importance as far as the matter in question is concerned: for on the point of view adopted by Professor Hommel, the larger as well as the smaller list doubtless admits of reduction This plan is to combine into one asterism (or station, to use the term employed by Professor Hommel) all those stars which are shewn by their names to have been viewed by the Babylonians as closely connected. The Babylonian list no doubt comprises a number of stars which were considered to constitute pairs: the two stars which Professor Epping by his calculations has identified as, β and ζ, Tauri, are designated on the tablets as the northern and southern *šur narkabti* (translated by Professor Hommel as 'ox of the wain'), η and μ, Geminorum, are called the western and the eastern star of the mouth of the Twins, α and β, Geminorum, appear as the eastern and western Twins, γ and δ, Cancri, are called the southern and the northern one of *pulukku* (translated 'Spindle' by Professor Hommel), α and β, Librae, are called the southern and the northern one of the Balance; γ and δ, Capricorni, appear as the western and the eastern one of—according to Professor Hommel's translation—the goat-fish; α and β, Arietis, are called the eastern and western one of the head of the Ram. Fourteen single stars thus being combined into seven pairs of stars, the list of thirty-one stars is reduced to one of twenty-four members, part of them pairs of stars, and part single stars. Epping's list of thirty-three stars appears to comprise eight pairs of stars, the counting of which as single stars would bring the number down to twenty-five. But it would probably not be difficult, by some further combination, to reduce this latter total by another unit, and thus again to arrive at what might be called a zodiac of 24 asterisms or stars.

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[1] 'Ueber den Ursprung und das Alter der Arabischen Sternnamen und insbesondere der Mondstationen' von Fritz Hommel, Zeitschrift der Deutschen Morgenländischen Gesellschaft, Vol 45, pp. 592–619

[2] Pp 610–12, of Professor Hommel's paper—The list numbers thirty stars only, but this is due to the mistake of one star (*Pulukku* = *a* Cancri) having received no running number.

Next, as to the lunar zodiacs of the Arabs, Hindus and Chinese. Here also Professor Hommel labours to show that those zodiacs, in their original form consisted of no more than twenty-four members. This argumentation concerns itself with the Arabic Zodiac chiefly, and the means by which he undertakes to reduce the twenty-eight stations of that zodiac to an earlier series of twenty-four is as follows —

He in the first place, assumes the two stations *al-Fargh al-awwal* (α and β, Pegasi) and *al-Fargh aṣ-sānī* (γ, Pegasi, and α, Andromedæ) to have originally constituted one station only, on the ground that in all the older passages which mention those stations, they are spoken of as one only, called *ad-dalwu.*[1] He further maintains the twelfth station—*as-Sarfah*—(β Leonis)—to have been a later insertion, chiefly for the reason that also the corresponding Indian Station, *viz*, *Uttara Phalgunī* appears, to judge from its name, to have originally formed one station with the preceding one, *viz*, *Pūrva Phalgunī* He next suggests that No 17—*al-iklīl* (β δ π Scorpionis) was not originally separated from the preceding station—*az-Zubānay*—, for the reason that the name of the corresponding Indian Station, *viz.*, *Anurādhā*, indicates that station to have once been one with the preceding station, which, in addition to its ordinary name, *viçākhā* is sometimes called *rādhā*. And he finally throws a doubt on the originality of the 21st station *al-Baldah*, with reference to the fact that the corresponding Indian Station may, on account of its name, *Uttarāshādhās*, be suspected to have originally constituted one station with the one immediately preceding (*Pūrvāshādhās*).

The lunar zodiac of the Arabs is thus reduced to a series comprising twenty-four stations. And as the four rejected stations are rejected for reasons derived from the nomenclature of the corresponding Hindu Nakshatras, it of course, follows that those four Nakshatras also must be viewed as later additions to an original Hindu series of twenty-four members only. Professor Hommel makes some remarks tending to show that also some of the Chinese *Sieu* are later insertions in an original less extended series, he does not, however, attempt to prove that just four members of the Chinese zodiac were not original. This, however, is a point of no great importance

Professor Hommel, thus, has established two series of asterisms—a Babylonian one and an Arab one—each of which comprises twenty-four members, and next proceeds to enquire how far the constituent members of the two series are identical In the comparative statement of the two lists, however, given by him on page 613, he exhibits, not the reduced Arabic list, but the ordinary list of twenty-eight stations We may follow him therein (since, in a comparison of the individual stars of the two lists, it does not make much difference whether we arrange them in twenty-eight or twenty-four stations), and, therefore, here re-produce the list as drawn up by Professor Hommel *in extenso.*

	Babylonian Series.	*Arabian Series*
1	timinnu, η Tauri	aṭ-ṭuraiyā, η Tauri
2	pidnu, α Tauri	al-debarān, α Tauri

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[1] To this we must add—following a line of reasoning adopted by Professor Hommel in three other cases—that also the names of the corresponding Nakshatras (*Pūrva-Bhadrapadās* and *Uttara-Bhadrapadās*) point to the fact of there having originally been one station, which, later on, was divided into two.

	Babylonian Series.	*Arabian Series.*
3	šur narkabti, β α ζ Tauri ...	al-haqʻa, λ, ϕ,^{1} ϕ^2 Orionis.
4	pū tu'āmi, η, μ Geminorum	al-hanʻa, η, μ, ν, γ, ξ Geminorum.
5.	tu'āmi, ša reʻi, γ Geminorum	
6	tu'āmi, α, β Geminorum ...	aḍ-ḍirā, α, β Geminorum.
7	pulukku, γ, δ Cancri ...	an-naṭra, γ, δ Cancri
8	rīs ari, ε Leonis	aṭ-ṭarf, λ Leonis.
9	šarru, α Leonis	al-ǧabha, α Leonis.
10	māruša ribu arkat, šarri ρ Leonis	az-zubra, δ, θ Leonis.
11	zibbat arī, β Leonis .	aṣ-ṣarfa, β Leonis.
12	šīpu arkū ša arī, β Virginis	al-ʻawwā, β η, γ Virginis.
13	šur ardati, γ Virginis	
14	nābū ardati, α Virginis	as-simāk, α Virginis. al-ghafr, ι, κ, λ Virginis.
15	zibānītu, α, β Libræ .	az-zubānay α, β Libræ
16	rīs akrabi, δ, β Scorpionis	al-iklīl, δ, π, β Scorpionis
17.	ḫabrud, α Scorpionis .	al-qalb, α Scorpionis.
18	mātu ša kasil, θ Ophiuchi .	as-saula, λ, υ Scorpionis.
		an-na ʻāyim Sagitt.
		al-balda Sagitt
19	ḳaran sugʻur, α, β Capricorni	aḍ-ḍābih, α, β Capricorni.
		ibula, ε, μ, ν Aquarii.
20	sugʻur, γ δ Capricorni	as-suʻūd, β. ξ Aquarii.
21.		al-aḫbiya, α, γ, ζ, η Aquarii
22.		ad-dalwu, α, β, γ Pegasi, α Andromedæ.
23	rikis nūni, η (Piscium)	al-ḫūt, β Andromedæ.
24	rīs kuṣarikki, α, β Arietis	an-naṭḫ, β, γ Arietis.
		al-buṭain a, b, c Muscæ

Observing that in the above two lists the stars constituting sixteen stations are absolutely identical, while there is an approximate agreement in six further cases, Professor Hommel considers himself justified in concluding that 'there cannot be any doubt that the planetary stations made use of by the Babylonians at the time of the Arsacide Kings, and the Arabic (as well as the Indian and Chinese), lunar stations are based on one and the same more ancient original

Now this conclusion I feel altogether unable to accept—In the first place there arises the difficulty of accounting for the acceptation of a zodiac of twenty-four asterisms, and its later transformation into one of twenty-eight members, by the Hindus, Arabs and Chinese alike. That the Babylonians who manifestly possessed from old times a real solar zodiac of twelve signs should at some later time have subdivided each station of that zodiac into two parts, is intelligible, for divisions comprising thirty degrees each naturally would, for many purposes, be found inconveniently large. For the same reasons we can understand the establishment of a series of thirty-six stars, three for each sign of the zodiac I do not see any proof of a series of twenty-four stations having ever actually been employed by the Babylonians; but as said just now, a motive for its formation is at any rate imaginable, in the case of those who, as a matter of fact, started with a zodiac consisting of twelve parts But for what purposes should we imagine that hypothetical zodiac of twenty-four members to have been borrowed by the other nations? What we positively know is that the Hindus, Arabs and Chinese possessed zodiacs comprising twenty-eight or twenty-seven members, *i e*, zodiacs having a special reference to the moon's motion. Professor Hommel would have us believe that the Chinese, Arabs and Hindus independently borrowed from the Babylonians a zodiac of twenty-four asterisms, that this zodiac was afterwards expanded by the Chinese into one of twenty-eight members, that the Hindus independently did the same, and that the Arabs finally added four members to their zodiac at the time when they became acquainted with Hindu astronomy. Now the zodiac of the Hindus is from the earliest time at which it appears a decidedly lunar one; the *nakshatras* are primarily those asterisms with which the moon in her periodic revolution successively enters into conjunction, and that the Hindu Series of twenty-eight or twenty-seven asterisms should have been preceded by one of twenty-four members, is therefore, *ā priori*, quite improbable. The same may be said of the Arab *manzils*, and also of the Chinese *sieu* The lunar character of the *sieu* is not so clearly apparent as that of the *nakshatra* and *manzil* But just for that reason an amplification of an earlier list of 24 asterisms—which would have fully satisfied all practical requirements—into one of twenty-eight members is all the less probable.

Professor Hommel speaks in several places of the twenty-four 'lunar' stations But a series of twenty-four stations can in no way be called 'lunar' A 'lunar' zodiac—whether we understand thereby a zodiac of lunar origin or one of prevailingly lunar application—can be constituted only by a series of either twenty-seven or twenty-eight asterisms.

There are further considerations which render improbable the hypothesis of the Babylonian Series of normal stars having been the prototype of the different lunar zodiacs With the Arabs as well as the Hindus and Chinese, the twenty-eight or twenty-seven members of their zodiacs appear from the very outset as stations, *i.e*, sections of the ecliptic, dividing the course of sun, moon, and planets into a number of parts. These sub-divisions may be viewed either as abstract fractional parts of the ecliptic, irrespective of any stars or asterisms; or else they may be conceived as marked by certain stars or groups of stars. In ancient Arabic literature the latter aspect prevails on the whole; the different seasons of the year are discerned and distinguished according to the successive risings of the stars or groups of stars that mark the stations But at the same time there are other passages which refer to the moon or sun as being within a station, and in which therefore the character of the stations as sub-divisions of the ecliptic appears very clearly In Sanskrit literature the *nakshatras* came at a very early period to be prevailingly viewed as subdivisions of the path of the moon and sun, although the more sensuous character of the stations as asterisms was by no means forgotten

Among the Chinese finally the *sieu* although defined by groups of stars are generally used only as subdivisions of the ecliptic they in fact hold in Chinese astronomy a position strictly analogous to that of the signs of the zodiac among Western nations It is true that in one point the Chinese zodiac has preserved a more unmistakablo mark of its origin than the zodiacs of the more Western nations, *viz*, in the inequality of extent of the twenty-eight *sieu* For this inequality can be explained only by the fact that the twenty-eight subdivisions of the ecliptic were made to correspond to twenty-eight groups of stars of, naturally, unequal extent

It thus appears that Arabs, Hindus, and Chinese alike used the stations of their lunar zodiacs in the same way as we use the signs of our zodiac, *i e*, as subdivisions of the sphere, and thereby of the path of sun, moon and planets If, therefore, the lunar zodiacs of those three nations were mere adaptations of an original Babylonian zodiac of twenty-four or more asterisms, we should expect that also the asterisms constituting that Babylonian zodiac should have been employed for the purpose of subdividing the ecliptic into as many parts, to which the motions of sun, moon and planets are referred But, as an examination of the Babylonian planetary tablets teaches, this is by no means the case As stated above, those tablets when intending to fix the position of a planet with accuracy, refer it to one of the normal stars When on the other hand the Babylonian astronomers could not—or else did not care to—define the place of a planet very exactly, they merely say in which of the twelve zodiacal constellations it was at the time The tablets say, *e g*, that on the evening of the 4th Airu—122, Mercury heliacally set in *te-te* (Taurus); and that on the 8th Tishritu—110, Mars heliacally rose in nūru (Libra) The Babylonian names of the twelve constellations of the zodiac are given in Epping's work, p 149, (*cf* also the discussion of these names by Strassmaier, pp 170–173), and a second rectified list is furnished in the *Zeitschrift für Assyriologie* for December 1892, p 223. We may also compare on this point Professor Hommel's paper under discussion, pp 610–12, and Professor Jensen's '*Kosmologie der Babylonier*,' pp 57–95 and 495–501.

According to the results arrived at by these scholars, the Babylonian names of the zodiacal constellations agree, on the whole, with the Greek ones, the most striking exception being that, in the place of Cancer, the Babylonians have a term *Pulukku* which is said to mean a 'spindle' And there seems no longer to prevail any doubt that the solar zodiac, with its twelve signs, was first invented by the Babylonians, and employed by them from a very early period. The need, therefore, which, in the case of other nations, supplied the chief reason for the establishment of a lunar zodiac, *viz*, the need of some subdivision of the zodiac into parts to which the motions of the heavenly bodies could be referred, did, as far as we can see back, not exist for the Babylonians, who already possessed a subdivision of the zodiac into twelve parts

A comparison of the designations of the Babylonian normal stars with the names of the lunar stations among the Arabs, Hindus, and Chinese, suggests similar conclusions. The names of these latter point throughout to an independent series of asterisms, *i e*, the name of each station indicates a star or group of stars, considered to constitute an independent whole by itself, not forming part of a larger group or constellation We must modify this general statement with reference to those Arab and Hindu stations which, by their designations, as 'first' and 'second,' or 'earlier' and 'later,' are shewn to have been viewed as parts of one more extensive constellation. But this qualification does not affect the contrast which the lunar mansions of the three nations form, in this respect, to the series of Babylonian normal stars For it is clear[1] that by far the greater number of the names of those stars point to the fact that the stars were viewed as belonging to one or other of the twelve zodiacal constellations We have the head of the Ram, the mouth of the Twins, the head of the Lion, the tail of the Lion, the hind-foot of the Lion, the anterior bull of the Virgin, the 'messenger' (?) of the Virgin, the Balance, the head of the Scorpion, the horn of the Goat-fish, the head of the Pourer (of water, Aquarius), the foot of the Pourer, the head of the Fish A few stars only have special names not directly pointing to any connexion of theirs with the zodiacal constellations, so, *e.g*, *pidnu* (Aldebaran) and *šarru* (Regulus) The Babylonian nomenclature of the stars near the Ecliptic thus seems, on the whole, to have been faithfully reproduced by the Greek Astronomers, who have special names for some few of the most conspicuous stars, while the great majority are simply referred to their places in the zodiacal constellations.

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[1] I here have to accept the interpretations of the Babylonian names given by Professor Hommel

In spite of the preceding reflections, which tend to shew that the Babylonian series of normal stars, and the lunar zodiacs of the three nations, differ in general character, it might be maintained that the Babylonians had for some reason or other singled out a certain number of—let us say, twenty-four—ecliptical stars or asterisms, which series was later on borrowed by the other nations and variously adapted to their own purposes. This, in fact, is, as explained above, the thesis advocated by Professor Hommel. We, therefore, must now examine in detail the steps of his argumentation.

That the normal stars of the Babylonians—whether 31 or 33 or 36, or in fact any approximate number—may without much difficulty be arranged, as is done by Professor Hommel, in a series of twenty-four members has been admitted before But it appears very much more doubtful whether we can follow Professor Hommel in the second step of his argumentation, *viz*, the attempt to show that, also, the different lunar zodiacs in their primitive form comprised twenty-four stations only. We will no longer dwell on the circumstance of a zodiac of twenty-four stations not being a lunar one at all, for the originally lunar character of the zodiacs under discussion might be called into question But what positive evidence is there for any of the three zodiacs concerned ever having comprised less than twenty-eight or twenty-seven members?—Professor Hommel does not attempt to show that the Chinese originally acknowledged twenty-four stations only, following G Schlegel, he merely remarks (Note 5, p. 606), that α and β Pegasi, and γ Pegasi and δ Andromedæ, which constitute the two *sieu* Tschi and Pi originally formed one station only.[1]

Concerning the Arab and Hindu Stations, Professor Hommel thinks, as shown above, that there are reasons for singling out four of them as later additions, and further conjectures that the addition was independently made by the Hindus only, and merely borrowed by the Arabs when they first became acquainted with Indian astronomy. We also have seen that Professor Hommel draws his reason for suspecting four Indian *Nakshatras* from their names. But the very indefinite indication supplied by the nomenclature certainly does not suffice to make up for the total absence of positive evidence as well as general probability. The Hindu Series, at any rate, appears from its very beginning as intimately and specially connected with the moon,[1] and we, therefore, neither expect to find, nor do we actually find, any trace of there having ever been less than twenty-seven or twenty-eight *nakshatras.* That in three cases two consecutive *nakshatras* are specially connected by having the same name—only differentiated by the addition of 'earlier' and 'later'—certainly does not suffice to prove that there originally existed a list of twenty-four stations, but can very well be accounted for by the supposition that when a series of twenty-seven or twenty-eight stations was established, there either already existed such names as *pūrva-* and *uttara-phalgunī*, or that existing names such as *phalgunī* were, for the purposes of the lunar zodiac, to be established, differentiated by the addition of *pūrva* and *uttara*, or else, the asterisms then being named for the first time, that two stations were united by a common name because they struck the eye as constituting one whole as it were The fact is, that in each case the stars of which the three pairs of *pūrva* and *uttara* consist, form an obvious and conspicuous square, so that nothing was more natural than to comprise them under one name, even on the part of those who distinctly viewed them as two stations. But even if there should have originally been an asterism called simply *phalgunī*, this would not prove that such an asterism ever formed a member in a series of twenty-four *nakshatras.*

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[1] We need not, of course, with reference to the point under discussion, pay attention to J B Biot's opinion that the Chinese Stations were originally twenty-four only, to which four more were added, at about 1100 B C. For that opinion has long been shown to have no historical foundation whatever, and would, even if found to be true, hardly help to confirm Professor Hommel's views, since the four stations which Biot declares to be later additions (*viz*, *Nu*, *Oey*, *Lieou* and *Ti*), are all included in Professor Hommel's hypothetical original series.

The name *anurādhā* finally, meaning 'that which follows on *rādhā*,' has no force whatever, to prove that the two stations were originally considered as one only, not any more than the name of the Arab *Manzil al-Debarān*, i e, 'the following one,' proves that station to have been at first one with the preceding station, *viz.*, *Thurayyā*, the Pleiades Had *rādhā* and *anurādhā*, i.e, α, β, δ, ι Libræ and β, δ, π, Scorpionis, ever constituted one primitive station, we might, moreover, reasonably expect to meet with the same stars combined in one group in the primitive Babylonian series assumed by Professor Hommel But this is distinctly not the case, for we there find α and β Libræ as *Zibānītu*

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[1] As has been raised beyond doubt by Professor Weber, in the course of the lengthy controversies carried on by him with several other scholars, concerning the original character of the *nakshatras.*

(Balance), and δ and β Scorpionis as *Riš-akrabi.* (Head of the Scorpion). It would be of interest, could we apply this latter test also to the three *pūrva* and *uttara* pairs of the Hindu series. The Babylonian list, however, exhibits not any stars either of Sagittarius—in which the two *Ashāḍhās* of the Hindus are situated—nor of Pegasus, and Andromeda, to which the two *Bhadrapadas* belong Of the three stars, on the other hand, which constitute *pūrva* and *uttara-phalgunī* (*viz*, θ and δ Leonis, β Leonis) one only, indeed, *viz.*, β, occurs in Professor Hommel's list, but another (*viz*, θ) is added in Epping's list (*Z f A.*, December 1892), and as the names of the two are *zibbat-arū* (tail of the Lion) and *zibbat-kalab* (?) *arū*, it seems that here the Babylonians also viewed the stars of two stations, as forming one group only.

There is, of course, no better positive historical evidence for the *Menāzil* of the Arabs ever having been less than twenty-eight, than there is in the case of the *nakshatras* In one case (*viz*, that of the two *Fargh*) we have a designation which, in a manner analogous to that of the Hindus, points to two stations being viewed as parts of one large constellation, but the case is the most striking one of the three mentioned above, in which this mental combination is almost inevitably provoked by the configuration of the group In the case of the three other *menāzil* (*as-Sarfa*, *al-Iklīl*; *al-Balda*), which Professor Hommel is inclined to view as having sprung from the later subdivision of large groups of stars into two stations, there is no other reason than the hypothetical later bi-partition of the corresponding asterisms of the Hindu Series. Professor Hommel wishes to connect the amplification of the assumed original series of twenty-four *menāzil* into the known one of twenty-eight, with the introduction of Hindu astronomical doctrines into Islamitic countries. But this hypothesis has absolutely nothing to rest on

We now advance to the last step in Professor Hommel's argumentation, *viz*, the attempt to show that the series of asterisms composing the different lunar zodiacs is fundamentally identical with the stars and groups of stars which the Chaldean Astronomers employed as their normal stars This is clearly the most important link in the chain of attempted proof. What we have considered so far might indeed be termed merely preliminary, or even comparatively irrelevant It does not, after all, greatly matter—an advocate of the Babylonian origin of the lunar zodiacs might say—whether the stations of the Hindus, Arabs, and Chinese were originally twenty-four or not, nor whether the Babylonian normal stars can be shown, or not, to fall into twenty-four groups; nor what the exact historical relation of the stations of the Arabs and Hindus may have been, nor how far the star groups of the Babylonians on the one side and those of the three nations on the other side, agreed or differed, as far as practical use is concerned As long as it can be shown that the two series of asterisms comprise, on the whole, the very same stars or groups of stars, it remains the most probable hypothesis that the selection of the asterisms was originally made in one place, and that, the zodiac thus established was later on borrowed by the other nations. Various differences,—which need not be minor ones only—may have sprung up later on, one or more nations may for purposes of their own have subdivided some of the primitive asterisms into parts, so as to increase the total number, one nation may have regarded the stations chiefly in so far as announcing, by their successive risings, the seasons of the year, another nation may have used them, prevailingly, as marking certain subdivisions of the Ecliptic which were required for facility of astronomical computation; the asterisms may have come to be viewed as mansions of the moon in one place and as mansions of the sun in another place, and in a third place they may have come to be practically used only as affording fixed points of reference for the ever-moving planets All this does not suffice to refute—or even appreciably to diminish the probability of—the view that four zodiacs which are identical, as far as the majority of their constituent groups is concerned, are nothing but modifications of one and the same prototype Nor can we in the present case look for that original zodiac anywhere else than in Babylon, which we now view with even much better reason than twenty years ago as the cradle of all astronomical science.

The reply to this is that, as a closer examination of the facts will show, the agreement of the Babylonian Series of stars with the lunar zodiacs of the other nations is by no means so close as to compel or even to render probable the derivation of the latter from the former In attempting to decide the question whether the partial identity of the two series of asterisms entitles us to infer a historical connexion between them, we must take care clearly to represent to ourselves the conditions of the problem, so as to distinguish what has true proving force from what has not. In doing so, we may, as Professor Hommel does in that part of his enquiry which here immediately concerns us, confine our attention to the Babylonian normal stars on the one hand, and the Arabian *menāzil* on the other hand; as the latter approximate most closely to the Babylonian Series, the whole argument may, indeed, with advantage be confined to them Now, what we positively and certainly know about the two series to be compared is, that the Arabs had a kind of zodiac comprising twenty-eight stars or groups of stars, to which they referred the motions of the moon and sun, and whose risings indicated to them the different seasons, while the Babylonians had a series of stars, to which they referred the motions of the planets. In addition, we may allow, that the normal stars of the Babylonians may—following certain indications given by their nomenclature—be combined in a number of groups, let us say, twenty-four, as Professor Hommel thinks The question then is whether the similarity of the two series of asterisms extends so far as to render it more probable that the two series go back to one and the same original, than that they were formed independently. Now it is clear that people, bent on establishing on the one hand, a series of what we may call luni-solar Mansions, and on the other hand, Astronomers wishing to select a series of stars to which the places of the planets can be referred, work under conditions from which the partial identity of the stars or star-groups selected follows with absolute necessity. In both cases, asterisms had to be selected which lay within the track of sun, moon, or planets, *i e.*, asterisms lying on, or not far from, the Ecliptic It, therefore, was in each case inevitable that specially brilliant stars which had the required position should be included within the Series To this class belong *a* Tauri (*Al-Debarān*, *pidnu*), *a* Leonis (*al-Gabba*, *šairu*), *a* Virginis (*as-Simāk*, *ṅābū ardati*), *a* Scorpionis (*al-Kalb*, *ẖabrud*), all of them stars of the first magnitude, and either on, or quite close to, the Ecliptic. The presence of these stars in two series, of course, proves nothing whatever as to their historical inter-dependence

The same remark may safely be extended to certain well-defined and conspicuous groups of stars which lie close to the Ecliptic, even if they do not contain stars of the first magnitude To this class belong the Pleiades (*al-turayyā*, *timinnu*), *a* and *β* Geminorum (*ad-dirā*, *tu'āmi*), a conspicuous pair of stars of the second magnitude, and perhaps also, *a* and *β* Libræ, two stars of the third magnitude, one of which lies on the Ecliptic These groups also could not be omitted by any one who in selecting asterisms was bound to follow the track of sun, moon, and planets In order to be convinced that two zodiacs are historically connected, we require to meet with coincidences of an altogether different kind, *viz*, with coincidences in cases where the absence of coincidence would not be surprising or possibly even *à priori* probable This point may be well illustrated by reference to the lunar zodiacs of the Arabs, Hindūs and Chinese What has, one may ask, driven the majority of scholars who have given that subject their attention, to the conclusion that those three zodiacs have not been formed independently of one other? In the first place, no doubt, the mere fact that they comprise each twenty-eight or twenty-seven members, and are thus marked out as lunar zodiacs. This circumstance however, would by itself be hardly sufficient to establish the conclusion in question, for the idea of laying out a zodiac in special connection with the periodic revolution of the moon is, if not an obvious one, at any rate such as may possibly occur to different individuals or nations independently The argument, therefore, really hinges on a second circumstance, *viz.*, the identity or partial identity of the asterisms constituting the different zodiacs But here also the distinction made above, has to be kept in view, and has actually been kept in view by all competent enquirers That the Arabs, Hindūs and Chinese alike, include within their zodiacs, stars like Aldebarān and Spica, and groups of stars like the Pleiades, and α and β Geminorum, can convince, and has convinced, nobody of the original connection of the three series, for in all such cases the selection was a matter of necessity rather than choice But something like conviction begins to form itself when we meet with cases where the three nations although free to take different lines, agree in following one and the same track. The coincidences falling under this head are not numerous, but some of them are highly striking There is, in the first place, the choice of three faint stars in Orion's head (λ, θ^1, θ^2) to constitute the *al-haka* of the Arabs, the *Mṛigaçiras* of the Hindūs, the *Tse* of the Chinese. There next is the choice of certain stars in the tail of the Scorpion, which lie at a considerable distance south of the Ecliptic to mark the *aš-šaula* of the Arabs, the *Mūla* of the Hindus, and the *Wĕi* of the Chinese. There further is the fact that all the three zodiacs agree in marking two of their stations by the stars constituting the so-called square in Pegasus, although all those stars have a high northern latitude (the two *Bhadrapadās* of the Hindūs, the two *Farghs* of the Arabs, *She* and *Pi* of the Chinese) To the same class of cases belongs the selection— met with, however, in the Hindu and Arab zodiacs only—of two stars of the third magnitude (δ and θ Leonis), which both have a high northern latitude, to constitute the *Pūrva Phalgunī* of the Hindus, and the *Chang* of the Chinese. We may also, I think, mention, under this heading, the inclusion within the series of the small stars 35, 39 *a* 41 *Arietis*—which form the *Bharanī* of the Hindus, the *al-Buṭain* of the Arabs, and the *Wei* of the Chinese, and perhaps, also, the fact that certain little conspicuous stars in Hydra—which, moreover, do not lie very close to the Ecliptic—were selected to constitute the *Açleshās* of the Hindus and the *Lieu* of the Chinese. In this last case, however, the Arab Zodiac deviates from the two others, in keeping close to the Ecliptic But, even if we abstract from the less striking cases, there remain a number of coincidences so remarkable that the hypothesis of a common origin of the three lunar zodiacs suggests itself almost inevitably. If, on the other hand, these striking coincidences were absent, the whole theory of a primitive connexion of the three zodiacs would enormously lose in probability Of the selection of the three faint stars in Orion's head, Professor Whitney says,[1] that 'it is not a little strange that the framers of the system should have chosen for marking the third station, this faint group, to the neglect of the brilliant and conspicuous pair, β, and ζ, Tauri. There is hardly another case where we have so much reason to find fault with their selection' The choice is indeed an unaccountable, apparently irrational one, but it, of course, is just this agreement in apparent irrationality which most strongly supports the view of the three zodiacs being derived from one original.

If, therefore, the series of Babylonian normal stars was originally connected with the lunar zodiacs, we should expect to find that it agrees with them in the striking peculiarities just enumerated, or, at least, in some of them But on an examination of the actual state of things, our expectations are totally disappointed From Aldebarān, the Babylonian Series advances, not to the stars in the head of Orion, but just to those stars which form the natural next link in an ecliptical series, *viz*, β and ζ Tauri. In Leo, again, it keeps to the ecliptic, in taking in ρ before going up to θ, the brilliant star β, Leonis, it leaves aside It does not go to the south of the Ecliptic, to take in the stars in the Scorpion's tail, but has, in their stead, θ Ophiuchi, which is situated close to the Ecliptic It does not go up to the north, to take in stars from Pegasus and Andromeda It comprises none of the stars which constitute the *Bharanī* of the Hindus, and the corresponding stations of the two other nations. In short, wherever the three lunar zodiacs coincide in a striking and characteristic way, the series of Babylonian normal stars deviates from them and follows its own track.

We might add to this list of characteristic deviations of the Babylonian Series if we look for one member of the comparison in an hypothetical primitive lunar zodiac, as *e g*, construed by Professor Whitney, (Lunar Zodiac, p 357). We should in that case, have to point out that where the primitive zodiac—as represented by *Āçleshās* and *Lieu*—goes down to the south, so as to take in stars from Hydra, the Babylonian Series sticks to the Ecliptic, selecting stars from Cancer. But as in this case the Arab Zodiac agrees with the Babylonian Series, it is more advisable to omit all reference to the hypothetical primitive zodiac

There now certainly remains a small number of cases in which the Babylonian Series agrees with the lunar zodiac, and where, at the same time, the agreement cannot exactly be called an inevitable one But I do not think that anybody who carefully examines these agreements will consider them sufficiently strong, especially when remembering the absence of agreement in all truly characteristic cases, in what, in fact, may be called test cases of the hypothesis of original connexion. I rather think it probable that any one following, in a Stellar Map, the track of the Babylonian normal stars and of the Arabian *menāzil* will be inclined to include in the list of inevitable coincidences several cases not thus classed by me above At the same time, there are minor discrepancies which might be urged It was, e g , as good as inevitable that a series of stars, bound not to wander too far from the Ecliptic, should contain some of the more conspicuous stars of Aries Accordingly, β Arietis appears both in the Babylonian and the Arab Series, but while the Babylonians add the brilliant star a Arietis, the Arabs omit a and join β and γ, as *Sharaṭān* In Gemini η and μ, a pair of stars of the third magnitude, lying quite close to the Ecliptic, could hardly be omitted. Nor could δ and γ Cancri, or at least the former of these two stars, be absent from an Ecliptic Series

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[1] *The Lunar Zodiac; Oriental and Linguistic Essays*, p. 351.

The same remark applies to β η γ, Virginis It is, on the other hand, surprising that neither κ nor λ, Virginis—which appear in the station *al-ghafr*—are included in the Babylonian Series. For Scorpio δ and β, two stars lying close to the south and north of the Ecliptic could hardly be overlooked. In the region where a and β Capricorni are situated, there are absolutely no other stars but these two, which could be included in an Ecliptic Series. A choice, on the other hand, was possible a little further on, and there we meet again with a noteworthy discrepancy, the Babylonian Series taking the stars closest to the Ecliptic, *viz* , γ and δ Capricorni, while the corresponding *manzil*—*as-su'ūd*—comprises β and ξ Aquarii, which are situated more to the north Where finally the Babylonian list has η, Piscium, not very far from the Ecliptic, the Arab *manzil* goes as far north as β Andromedæ

With regard to some of the discrepancies here noted, Professor Hommel directs attention to the circumstance that the stars comprised in the Babylonian Series, on the one hand, and the Arab Series on the other hand, have, at any rate, nearly the same longitude , and seems to consider this as a sign of the original identity of the two series. But this circumstance really proves nothing. That the groups of stars actually chosen occasionally have almost the same longitude, naturally follows from the conditions of the task the Babylonians as well as the Arabs had set themselves, *viz* , of dividing the Ecliptic by stars, or star groups, into 28 or, let us say, 30–36 parts

The various considerations set forth in what precedes, render it in my opinion, altogether impossible to look on the normal stars of the

Babylonian Tablets as the original of the different lunar zodiacs. As said at the outset of this paper, the hypothesis of Babylon having been the place where such a zodiac was first established was not an unlikely one, at a time when hardly any thing authentic was known about Babylonian Astronomy But at present that hypothesis has greatly lost in probability We now know, from authentic Babylonian sources, that the Chaldeans, from an early time, distinguished twelve zodiacal constellations, and referred to them, or else to certain definite stars in them, the positions of the planets The number of those definite stars, or star-groups, amounted, in later times at any rate, to more than thirty, perhaps thirty-six It is possible that an earlier series, used for the same purposes, consisted of twenty-four members only. But there are no traces of any series consisting of that number of stations which is characteristic of a lunar zodiac, *viz*, twenty-seven or twenty-eight. Nor is there anything like a characteristic agreement between the stars and star-groups, constituting the lunar zodiacs of the Hindus, Arabs and Chinese, and the series of normal stars used by the Babylonian Astronomers. The conclusion to be drawn from all this, is that the hypothesis of the Babylonian origin of the *Nakshatras*, *Manzils* and *Sieu* has, for the present at least, to be set resolutely aside

Further Observations on the History and Coinage of the Gupta Period.—

By VINCENT A. SMITH, *Indian Civil Service*

(With Plate VI)

(Read December, 1894)

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PART I —GENERAL OBSERVATIONS

Although no very long period has elapsed since the publication of my last work on the Gupta Coinage,[1] sufficient material has accumulated in the interval to warrant the preparation of another Supplement. The elaborate papers by the late Sir Alexander Cunningham on the coinages of the Later Indo-Scythians, and of the Ephthalites, or White Huns, have thrown much light on the history and coinages of dynasties closely connected with the Guptas, and have tempted me to wander a little beyond the confines of the Gupta field which I have hitherto cultivated

Since I have been stationed at Gōrakhpur, I have had the opportunity of examining the large and varied collection of coins formed by my friend, Dr. William Hoey, I.C.S. The most remarkable coins of the Gupta Period in his cabinet are noticed in this paper. On other occasions I hope to publish some of the novelties in other departments which he possesses. Dr Hoey's cabinet has supplied me with a large proportion of my material on the present occasion, though I have not neglected other sources of information

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[1] *Observations on the Gupta Coinage*, read at the International Congress of Orientalists, London, 1892, and published in the *Journal of the Royal Asiatic Society*, for 1893 In the following pages this work is cited as *Observations*.

My remark (*Observations*, p 80) that 'the year of the Gupta Era appears, according to the most recent calculations, to have been A D 319-20,' is somewhat obscure It means, as stated in the Synoptic Table, that the year 0 was 318-19, and the year 1 was 319-20 The statement rests on the *dictum* of Dr Buhler (*On the Origin of the Gupta Valabhi Era*, p 3), that 'the weight of the evidence is in favour of the year 318-19, as the true beginning of the Gupta Era'[1] Dr Fleet is, or was, of opinion (*Indian Ant* Vol. XX, p 388) that the Gupta Era, as used in Central India and Nēpāl, and all northern inscriptions, is to be expressed by the formula,—Year 0 = 9 March, A D 319—25th Feb, A.D 320 Year 1 (current) = 26th Feb, A D 320—15th March, A D 321 According to Dr Fleet, the equations for the Valabhi variety of the era, are year 0 = 11th Oct, A D. 318—30th Sept, A D 319. Year 1 (current) = 1st Oct, A D. 319—18th Oct, A.D 320 I presume that this western, or Valabhi Era, is to be used in interpreting the coins and inscriptions from Gujarāt, though this detail does not seem to be yet determined I am quite incapable of understanding the elaborate calculations about Hindū dates in which Dr Fleet and some of his coadjutors delight, and must content myself with expressing the hope that the experts who do understand them will soon be able to complete their labours, and settle definitely the exact era to be used in the calculation of Gupta dates, both for Western and Northern India

The copper-plate inscription found at Pālī, near Kōsam (Kauçāmbī) in the Allāhābād District, in 1891, is dated in the year 158, which is probably to be referred to the Gupta era This plate is now in the Lucknow Provincial Museum, and has been described in *Epigraphia Indica*, Vol II, p 363.

Another newly-discovered inscription of the Gupta Period has been briefly noticed by Dr Hoernle in the *Indian Antiquary* for February, 1892, Vol. XXI, p 45. This record, which may be called the Farīdpur Inscription, was found in the Farīdpur district of Eastern Bengal It is a copper-plate bearing an inscription in early Gupta characters of the North-Eastern class The purport of it is to record a gift of land to a Brāhman in the reign of *Çrī Mahārājādhirāja Dharmāditya* The seal bears the device of Laksmī, standing, with an elephant on each side, besprinkling her. Dr Hoernle suggests that this device may have been the early seal of the Gupta kings before they adopted the Garuda device The inscription begins in the style usual in the Gupta inscriptions, and applies to king Dharmāditya the epithet '*Apratiratha*,' 'unsurpassable,' which is the special epithet of Samudra Gupta, both in coins and inscriptions These circumstances naturally suggest to Dr Hoernle the hypothesis that Dharmāditya may be merely a title of Samudra Gupta This suggestion is plausible, though not convincing I doubt if the Lakṣmī device can ever have been the family device of the Guptas The use of the Garuḍa cognizance was well established in the time of Samudra Gupta, who used it on his 'Javelin' and 'Archer' coins, in the form of the standard, and on a seal. The seal referred to is that of the spurious Gayā grant (Fleet, *Gupta Inscriptions*, p 255, pl. xxxvii). I agree with Dr Fleet in believing that, though the grant is a forgery, the seal is perfectly genuine. The "Garuḍa-marked tokens" (*i e*, probably, gold coins) are mentioned in the Allāhābād inscription, as having been offered to Samudra Gupta (*Fleet*, p 14, *note*) by the subject nations It is, therefore, improbable that this sovereign changed the family cognizance from the Lakṣmī to the Garuḍa device. The Farīdpur record unfortunately is not dated If it was not executed on behalf of Samudra Gupta himself, it certainly seems to be approximately contemporary with him, and may very probably be a record of Kācha, whom I believe to have been the brother and predecessor of Samudra Gupta.

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[1] Kielhorn (*Trans Intern Congress of* 1892 I, 429) holds that, according to the prevailing custom of the Hindus, the dates are given in *expired* years, and that "a similar conclusion is forced on us in regard to the Gupta era, the true epoch of which I believe to be A.D. 318-319, not 319-320"

I observe that Dr Fuhrer, in his label on the seal of Kumāra Gupta II, in the Lucknow Museum, definitely adopts the reading *Sthira* for the name of the predecessor of Nara Simha Gupta, and interprets it as a synonym for Skanda [1] I adhere to the opinion (*Observations*, p. 83, *note*) that it is more probable that Sthira Gupta was the brother of Skanda Gupta, and that Skanda Gupta was omitted from the genealogy of the seal inscription, owing to his having died, leaving no male issue. Dr Fuhrer reads the name of the queen of Nara Simha Gupta as being Mahā Lakṣmī Dēvī.

The palæography of the Gupta Period is discussed by Dr Hoernle in his paper on the Weber Manuscripts, in *J A. S*, *Bengal*, for 1893, Vol. LXII, Part I., p 4, and in the *Indian Antiquary* for February, 1892, Vol. XXI, p. 40 *seqq* The subject is further illustrated by the same scholar's publications on the Bower Manuscript.

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[1] In reply to a reference, Dr Fuhrer writes under date 3rd December, 1894 — "I have looked again at the disputed reading on the Bhitarī seal of Kumāra Gupta II, and cannot agree with Dr Hoernle's reading of Pura Gupta, or Cunningham's Puru Gupta There is no doubt it is Sthira Gupta, as Buhler reads I sent Bühler *a cast* of the seal for the Vienna Oriental Institute at the time, and feel sure you would agree to the reading, if you saw the original with a magnifying glass When you next pass through Lucknow, I shall be glad to show it to you." [See a note by Dr Hoernle at the end of this paper —Ed]

An interesting hoard of Gupta gold coins, which may be referred to as "the Hājīpur hoard," has been recently described by Dr. Hoernle The deposit is said to have been found by a boy "among brick rubbish in a small walled enclosure near Kunahrā Ghāṭ, in the bāzār of Hājīpur on the 2nd or 3rd of August, 1893" Altogether, 22 coins were found, though only 14 of these were recovered through the Collector of Muzaffarpur. (*Proc*, *A S. Bengal*, March 1894, p. 5)

The details, are:—

King	*Type*	*No of Specimens*	*Reference*
Candra[1] Gupta I,	King & Queen	1	*Coinage*,[2] Pl I 1
Samudra Gupta II,	Archer	1	„ „ „ 10
„ „ „	Javelin	2	„ „ „ 7
„ „ „	Battle-axe, var *a*	1	„ „ „ 11
Candra Gupta II,	Archer, Class I, var. *a*	2	*Not figured*
„ „ „	„ „ II	1	*Coinage*, Pl I 16
„ „ „	Combatant Lion	3	„ „ II. 5
„ „ „	Umbrella, var *β*	2	„ „ II 8
	new var	1	*Not figured*

My friend Mr C S. Delmerick has been successful in collecting a good many gold and copper Gupta coins in the Badāon District, which lies between the ancient capital cities, Ahichatra (Rāmnagar) in the Barēlī District and Kanauj in the Farrukhābād District Mr. D. Ernst of Calcutta has a nice set of eleven gold Gupta coins, collected chiefly at or near Cawnpore. The set includes some rare, but no new coins

PART II —GUPTA GOLD COINS

KĀCHA OR KACHA

Standard Type—(*Coinage, p* 74, *Observations, p* 95.)

A coin obtained by Dr Vost from the Hardoī district in Oudh, distinctly gives the name as *Kācha*, with the long vowel, in both places On the margin the long vowel is indicated by a short horizontal line to the right, on a level with the head of the *K* Below the arm it is indicated by a similar short line above the head of the *K*. This coin closely resembles the B M Prinsep specimen, figured in *Coinage*, Pl I, 3, and the vowel mark for *ā*, under the arm, is formed the same way in both coins

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[1] I particularly dislike using the English *c* instead of *ch*, as the equivalent of च, but am obliged to conform to the system recently sanctioned by the Council of the Asiatic Society of Bengal.

[2] The reference *Coinage* is to my treatise on *The Coinage of the Early or Imperial Gupta Dynasty*, with five plates (*J. Roy. As. Soc.* for 1889).

SAMUDRA GUPTA

Tiger Type.—(*Coinage*, p 64, *Observations*, p 96)

Until recently this extremely rare type was known from a single coin only, the Eden specimen in the British Museum (*Coinage*, Pl I, 2) In 1891, Mr Rapson published a notice of a "poor specimen" in Mr Wilmot Lane's cabinet

Dr Hoey possesses a third example, in very fine condition (See Pl VI, fig 1) This coin agrees with my description, except that a standard, or sceptre, surmounted by a crescent, and adorned with ribbons, is inserted in the field between the bow and the tiger. This object resembles the standard on the obverse, but is shorter The obverse legend is damaged, though the characters व्याघ्र × × क्र × *Vyāghra* [*parā*]*kra*[*ma*] are recognizable.

SAMUDRA GUPTA.

Battle-axe Type.—(*Coinage*, p 72, *Observations*, p 102)

Variety *β* (*Coinage*, p 73), characterized by the syllable कृ *kr* under the king's arm, has hitherto been known from a single specimen, that from the Eden cabinet in the British Museum

Dr Hoey possesses a second example in good condition, which seems to be struck from the same die as the British Museum coin

CANDRA GUPTA II.

Archer Type

The sub-variety of Class II, var *a* (*Observations*, p 105), which is characterized by the absence of the usual personal name *Candra*, under the king's arm, was until now known only from Mr. Rivett-Carnac's example

Mr C S Delmerick, who has recently been collecting Gupta coins with considerable success in the Badāon district, has obtained a second fine specimen This piece is a broad coin, diameter 875 inch Instead of the name under the arm, the king's sword is very distinctly shown. The figure of the king is upright. Lakṣmī on the reverse has her left hand resting on her hip.

CANDRA GUPTA II

Umbrella Type.—(*Coinage*, p 91, *Observations*, p. 113.)

The above-cited publications describe only two varieties, namely, *a*, in which the reverse goddess stands to left on a pedestal (or, in one instance, on a curved line), and *β*, in which she stands, facing front, on the back of a monster.

A third variety, γ, must now be added, in which the goddess, turned to left, walks or stands on the ground. The existence of this variety was first indicated by Dr Hoernle, in *Proc*, *A S. B*, for April, 1893, p 95, when describing a coin presented to the Indian Museum by Mr Rivett-Carnac (See Plate VI, fig 2) The reality of this new variety is now fully established by an excellent specimen in Dr Hoey's possession. (See Pl VI, fig 3) The reverse of this coin is in perfect condition, and the marginal circle of dots is immediately below the feet of the goddess The obverse legend seems to be *Candra Gupta*, with traces of *Mahārājādhirāja*, which words do not occur on other specimens

A coin in the Hājipur hoard and marked No 13,815 in the Indian Museum (*ante*, *p* 167), described by Dr Hoernle (*Proc*, *A S B* for 1894), exhibiting the "goddess walking to left, with fillet in right hand," constitutes a sub-variety (Pl II, fig 4) It will be observed that the attitude of the obverse figures on the several coins varies slightly. The legends are imperfect

KUMĀRA GUPTA I,

Swordsman Type

This type, heretofore known from two specimens, both found in the bed of the Ganges, near Patna, of which one is in the British Museum, and the other in the Bodleian Library,[1] is now represented by a third example, given to the Indian Museum by Mr Rivett-Carnac "Where this coin, now belonging to the Indian Museum, was found is not known, but it is a genuine specimen, and has a gold loop soldered to its rim, showing that it was used as an amulet, or ornament" (Dr Hoernle, in *Proc*, *A S. B*, April, 1893, p. 95)

KUMĀRA GUPTA I

Archer Type—(*Observations*, *p* 116)

A poor specimen of variety 1 of this type, in Dr Hoey's cabinet, is remarkable for having the rare trefoil monogram, No 25, which occurred on two specimens from the hoard of Bharsar, near Benares (*Coinage*, p 96) The gold is poor and alloyed (Pl VI, fig 5)

SKANDA GUPTA

King and Queen Type

My Catalogue (*Coinage*, *p* 111) mentions only two specimens of this type, one from Kanauj in the British Museum, and the other, said to be in the cabinet of the Asiatic Society of Bengal I have recently bought a third specimen, which was found at Bhitarī in the Ghāzīpur district. (Pl. VI, fig. 6)

This coin is in good condition In my description of the obverse of the type (*Coinage*, p 110) the remark that the bird, or Garuḍa, standard is furnished "with pennons" is erroneous, there are no pennons either on the Kanauj or the Bhitarī coin The Bhitarī coin shows no trace of any obverse marginal legend, but has distinct remains of names over each figure. The name स्क *Skanda* is placed vertically between the king's head and the Garuḍa, the first letter स *s* being deficient. The queen's name is, unluckily, illegible It is placed over the queen's head, and the letters प्रिया *priyā* may be doubtfully read as the concluding element of the name This defect is unfortunate, because the name of Skanda Gupta's queen is not recorded in any of the known inscriptions. The discovery of this Bhitarī specimen makes it certain that the type is rightly named the King and Queen type. The queen on this coin holds behind her back a long stem, probably that of a lotus flower. The reverse legend श्री स्कन्द गुप्तः *Çrī Skanda Guptaḥ* is distinct. The monogram is indistinct. Mr. D. Ernst possesses a fourth specimen, not quite so good as mine

ÇAÇĀṄKA (NARĒNDRA GUPTA.)

Bull Type.—(*Observations*, p. 147.)

Only two specimens of this type are described in *Observations*, and the paucity of specimens at my command led me into some errors of description By the kindness of Dr. Hoernle I have been enabled to inspect several examples in the cabinet of the Asiatic Society of Bengal, and to correct the errors and supply the omissions in the descriptions published by Cunningham and myself

The amended technical description is as follows:—

Obv—King, facing front, mounted on recumbent bull, which is to l, king's r hand, or elbow, resting on bull's hump, his l hand raised Disk (moon) over bull's head Marginal legend on r, imperfect, श्री श *Çrī Ça*[*çāṅka*] Below bull two characters, which vary

Rev—Lakṣmī on lotus seat, in debased style, though the legs are separate, and not combined into a bar, as in the debased Gupta coins. Her r hand is extended, her l arm grasps a stalked lotus bud On each side, in upper field, a minute elephant, sprinkling the goddess.

Legend on r margin, श्री शशाङ्क *Çrī Çaçāṅka*. No mon

The coins are of coarse, thick fabric, and very rude execution. Some specimens have large dots round the margins. The gold is extremely impure, and according to Cunningham's analysis (*Coins of Med. India*, p 16), contains 58 p. c of alloy The proportion of alloy seems to vary in different specimens *The highest weight noted is 147 grains. Diameter varies considerably The elephants are often so debased as to be unrecognizable.

References and Remarks.

B M—(*Observations*, Pl III, 11) The first of the two characters below the bull is certainly स *sa*, and the second seems to be क *ka*.

C—The first of the two characters below the bull is स *sa* From Gayā

A C—(*Coins of Med India*, p 19, Pl II, 5) The characters below the bull are distinct, and read by Cunningham as *jaya* The first character is certainly ज *ja*, and the second seems to be य *ya* From Gayā.

A S B—Six or seven specimens. On one the characters below the bull are plainly सज *saja* Three of these coins are figured in Plate VI (figures 8, 9, 10)

Hoey—The gold in this coin seems to be less impure than that of the others (Plate VI, 7)

The name Çaçāŋka means "marked with the hare," which is an epithet of the moon The name is, therefore, in meaning equivalent to Candra I presume that the disk over the bull's head on the coins is intended for the moon, rather than for the sun

The references to passages in Cunningham's *Archæological Survey Reports* concerning Çaçāŋka, given in *Observations*, are not quite correct. They should be as follows—I, 5, 10, III, 80, 138; VIII, 71, 72, 191-193, IX, 157, XV, 102

The reference to Vol VII, Plate VI, given both in *Observations* and in my *General Index* to the *Reports* for Çaçāŋka's seal-matrix at Rohtās, is a blunder for which I am quite unable to account The only reference to the seal-matrix, which I can find in the *Reports*, is a passing allusion to its existence in Vol IX, p 157

The inscription of this seal-matrix has been published by Dr Fleet (*Gupta Inscriptions*, p 283, Pl xliii, B) It consists merely of the words *Çrī Mahāsāmanta Çaçāŋkadēvasya*, surmounted by the figure of the bull. There can be no doubt, that this record, and the gold coins, must be assigned to the king of Karṇa Suvarna, in Central Bengal, who reigned at the beginning of the seventh century, A D Dr Fleet is of opinion, that the term "*Mahāsāmanta*, *lit*, 'a great chief of a district,' is a technical official title, which seems to denote the same rank as *Mahārāja*."

The position of Çaçāŋka's kingdom of Karṇa-Suvarṇa has recently been discussed by several writers

Mr Hewitt believes that the portion of that kingdom visited by Hiuen Tsiang is now the district of Mānbhūm, which is held by the Rājas of Pachete, whose crest is a bull, and that the capital of the kingdom was Campā, the modern Bhāgalpur.[1]

Dr Waddell seeks to identify the capital with Kancannagar, a suburb of Bardwān[2]

Both these identifications are certainly wrong, and based on false etymologies or other insufficient grounds

Mr. Beveridge gives excellent and substantial reasons for placing the capital of Karṇa-Suvarna at Raṅgamāṭī, in the Murshīdābād district[3] He is mistaken in supposing his identification to be a novelty[4] It had been made many years ago, and forgotten A note in the *Indian Antiquary* for 1878, explains that in Hiuen-Tsiang's text the word *Kin-eul*, 'golden-eared,' or 'having gold in the ears,' corresponding to the Sanskrit Karna-Suvarṇa, refers to "the town of Rangāmaṭṭī, 12 miles south of Murshīdābād [which] stands on the site of an old city called *Kurusona-ka-gadh*, supposed to be a Bengālī corruption of the name in the text *Jour*, *As. Soc Beng*, Vol XXII (1853), pp 281, 282, *Jour R As Soc* (*N S*), Vol VI, p 248"[5] The discovery of the site of Karna-Suvarna is due to Captain L P Layard, whose paper entitled *The ancient city of Kansonapuri, now called Runqamutty*, was published in the *Journal* of this Society for 1853.

It would seem to be true that Çaçāṅka was also known by the name of Narēndra Gupta, though the evidence for the alleged fact is not conclusive In 1879, Cunningham observed that "Professor Hall has suggested that his full name may have been Sasângka Gupta, but I learn from Dr Buhler, that in the Jain books Sasângka is called Narēndra Gupta"[6] Dr Buhler informs me that Cunningham's reference to the Jain books is due to a misreading of a communication from Dr Buhler, who really wrote that Çaçāṅka is called Narēndra Gupta by Bāna The word Bāna seems to have been misread as Jaina

A year earlier, in 1878, the anonymous writer in the *Indian Antiquary*, who has already been quoted, boldly made the assertion that Çaçāṅka is called Narēndra Gupta in the *Harsacarita* of Bāna, His words are "In Chinese *Yuĕi*, 'moon.' This is S'aśânka Narendra Gupta of Bâna's *Harshacharita*," and again, "Râjyavardhana ..himself was defeated and killed by S'aśânka Narendra Gupta, king of Gauda or Bengal and succeeded by his younger brother Harsha, whom his officers urged to avenge his brother's death. But the Hindu epic breaks off on the recovery of Râjyaśrî among the Vindhya mountains—See Hall's Vâsavadattâ, pp 51, 52, *Jour*, *Bo Br R As. Soc*, Vol X, pp 38-45."[1]

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[1] *J*, *R As Soc*, for 1893, pp 294, 300

[2] *Proc*, *A S B*, Dec 1892, p 184, Appendix to *Discovery of the Exact Site of Açōka's Capital of Pāṭaliputra* (Calcutta, published by Government of Bengal, 1892),

[3] *Proc*, *A S B*, Dec 1893, p 172, *J A S B*, Vol LXII, Part I (1893), pp 315–325. *The Site of Karna-Suvarna*

[4] *Ut supra*, *J*, *A S B*, p 326

[5] *Ind Ant*, Vol VII, p 197, *note* 5.

[6] *Reports*, Vol IX, p 157.

The English authorities quoted do not support the assertion that Çaçāŋka is called Narēndra Gupta by Bāna, and none of the writers referred to cites any passage from Bāna's text. The manuscript used by Hall apparently gave Çaçāŋka the cognomen of Gupta, because Hall states (p. 52) that Gupta, king of Gauda, slew Rājyavardhana. Hiuen Tsiang relates that Rājyavardhana was treacherously slain by Çaçāŋka, king of Karnasuvarna in Eastern India[2] Assuming both writers to be stating the truth, it follows that Çaçāŋka, king of Karnasuvarna, is identical with Gupta, king of Gauda. The fact of the treacherous murder of Rājyavardhana is confirmed by the Madhuban copper-plate of Harṣavardhana[3] Dr Buhler states that one manuscript of the *Harsacarita* does give the full name of Narēndra Gupta to Çaçāŋka

The translation of the *Harsa-carita*, which Professor Cowell and Mr Thomas have undertaken for the Oriental Translation Fund, will probably do much to clear up the history of Northern India at the beginning of the seventh century A D

PART III —GUPTA COPPER COINS.

CANDRA GUPTA II

Mahārāja Type (New)

Obv.—Bust of king, bareheaded, to l., with flower held between finger and thumb of r hand, as in the Vikramāditya Bust type

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[1] *Hiwan Thsang's account of Harshavardhana, Ind Ant*, Vol VII, (August 1878), p 197, *notes* 4, 6 The paper in the *Bombay Asiatic Society's Journal* referred to is one by the late Dr Bhāu Dājī, entitled *The Harsha-charita of Bāna*, which was read on 10th August, 1871.

[2] Beal, *Buddhist Records of the Western World*, Vol I, p 210

[3] This inscription states that the prince "gave up his life in the mansion of his foe, owing to his adherence to a promise" (Buhler on *The Madhuban Copper-Plate of Harṣa, dated Samvat 25*, in *Epigraphia Indica*, Vol I, p 70.) Two other inscriptions of Harṣavardhana are now known, namely, the Sōnt seal (Fleet, *Gupta Inscriptions*, p 231, Pl xxxi, B), and the Banskhēra copperplate, dated 32 (=A D 638), recently discovered twenty-five miles from Shāhjahānpur (*Pioneer*, September 21st, 1894)

(*Coinage*, p 140) The bust occupies the entire field, so that there is neither exergue nor legend

Rev.—Garuda standing on horizontal line, which does not extend to either margin In lower half of field is the legend महारज चन्द्र ग *Mahārāja Candra Ga;* the vowel mark over the र being deficient. The character च *Ca* is distinct, but the following characters are not. (Plate VI, fig 11.) Diameter ·875 Wt 105.

This coin was obtained by Mr J. P Rawlins, District Superintendent of Police, at a remote village in the Jhelam District of the Pañjāb, and was communicated to me through Mr C. J Rodgers. The kindness of the owner has enabled me to examine the coin, and have it photographed

The obverse bust of this type and of the Vikramāditya Bust type seems to be a rude imitation of the device of the gold coins of Huvishka on which the king is represented holding an ear of corn. (Gardner, *Coins of Greek and Scythic Kings*, Pl. xxvii, 9, etc.)

The weight (105 grains) of this piece, which is in fairly good condition, is, perhaps an indication that the coin was struck to the standard of the contemporary gold *dīnārs*, that is to say, to a standard of about 125 grains It can hardly be intended for a ¾ *paṇa* of 108 grains. I take the *ratī* as equivalent to 1·8 grains.

KUMĀRA GUPTA I, (or ? II).

Garuḍa Type (New).

Obv.—The letters श्रीकु, *Çrī Ku*, in large, bold characters of the period, occupy the greater part of the field. Above, Garuda standing on horizontal line. Dotted circle

Rev —Lakṣmī seated, executed in a very rough and degraded way, so that details are indistinct. A peculiar symbol in l. field. Dotted circle Diameter about ·7 inch wt 52 grains. Condition good.

This coin, which was bought by Mr C J. Rodgers at Sahāranpur, is now in the cabinet of Mr W Theobald at Budleigh-Salterton, Devon. I sent a drawing of the coin last year to Mr Rapson for publication, but, as the coin has not yet been published, I insert this notice of it.

KUMĀRA GUPTA I AND SKANDA GUPTA.

Fantail Peacock Type.

I venture to think that the arguments in *Observations*, (pp 137-144) have sufficiently established the fact that both Kumāra Gupta I and Skanda Gupta struck copper coins similar in device and size to the silver hemidrachms. The northern specimens of this copper coinage, like the contemporary silver hemidrachms, bear the reverse device of a peacock with expanded tail

In addition to the few examples of this northern copper coinage, noted in *Observations*, p. 138, I may now add the following

Lucknow Museum.—Two specimens of Kumāra Gupta from Sañcāṅkōṭ in the Unāō district Two specimens of Skanda Gupta from Kōsam (Kauçāmbī), near Allāhābād. One specimen of Skanda Gupta from Ajōdhyā.

Hoey—One worn specimen, probably of Kumāra Gupta, from Oudh.

None of these coins show any signs of plating

Addendum to Parts I, II, and III

Sir Alexander Cunningham's valuable posthumous work on the *Coins of Mediæval India* came to hand too late for me to make use of it in the preceding text But it contains a considerable amount of novel matter concerning the Guptas, which must be noticed in an essay professing to bring Gupta numismatics up to date

Cunningham, without giving any reasons, has adopted the reading Puru Gupta, as that of the name of the son of Kumāra Gupta I, in the Bhitarī Seal record He never saw the original, and his reading cannot be accepted for reasons already stated (*ante*, *p* 166)

Cunningham fixes Skanda Gupta's accession to undisputed power in the Gupta year 134, or A D 452 (misprinted 152 in text, p 11). This date, which I also had adopted (*Observations*, p 83), is too early Dr Vost has lately acquired a hemidrachm of Kumāra Gupta I, with a well preserved date, which is 136

Cunningham figures (Plate II, 1) a coin of Nara Bālāditya to show that the character between the king's feet must be read *Gu*, not *grē*, and he interprets the character read *Gu*, as a contraction of *Gupta* But he overlooks the very distinct vowel mark for *ē*, shown in his plate, and in mine (*Coinage*, Pl III, 11) This mark is equally plain on a coin from Bhitarī in my possession With all respect, therefore, for Cunningham's opinion, I adhere to my reading *grē*. On Gupta coins the word *Gupta* is never abbreviated, and never placed between the king's feet The form of the character which Cunningham reads as *Gu*, and I read as *gr*, is identical with one of the forms of the numeral 7 in some of the Gupta inscriptions [1]

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[1] See Bhagwān Lāl Indraji's paper on *Ancient Indian Numerals* (*Ind. Ant.* Vol. VI, p 42)

The coin of Kumāra Gupta II, Kramāditya (Pl ii., 2), figured as "a novelty," has been already published by me twice. (*Coinage*, Pl. ii., 12, *Observations*, p 129.)

The Archer coin (Pl ii., 3), with the name *Jaya* under the king's arm, and sun standard to his proper right, has not, I think, been before published The reverse device is that of the lotus-seated Lakṣmī, and the legend, which is quite illegible on the plate, is read doubtfully as *Çrī Prakālāya*, which cannot be right. I am unable to define Jaya [Gupta's] dynastic place, but he is certainly one of the later local kings subsequent to Skanda Gupta The coin belongs to the class of heavy (*suvarna*) coins, its weight being 140 grains.

The coin of Viṣṇu Gupta Candrāditya (Pl. ii., 4) was long ago figured in *Ariana Antiqua* (Pl xviii, 24), and was again described by Thomas in his paper, entitled *Indo-Scythian Coins with Hindī Legends* (*Indian Antiquary* for 1883) Cunningham places the accession of Viṣṇu Gupta in A D 680, which date cannot be far wrong In figure 5 of the same plate a coin of Çaçāṅka is depicted The letters under the bull are clearly जय *jaya*

Figure 8 represents the obverse only of a Gupta copper coin, thus described —

"Weight 87 grains. Diameter ·85 inch. Author, from Ahichhatra. The largest copper coin of the Guptas yet found

"Female bust to left, with flower in right hand.

"*Garuda* symbol or standard of the Guptas, legend lost"

This coin appears to be an inferior specimen of the new type, which I have described from Mr Rawlins' coin, and named the Mahārāja type The bust is that of the king, not of a female It is to be observed that the king's face is turned to the left in all Gupta copper coins, and to the right in the silver coins.

Figure 9 represents a silver hemidrachm of Candra Gupta II which Cunningham believes to be dated in the year 80 odd For the reasons given in *Coinage*, pp 122, 123, I do not believe that this coin is dated The character which looks like a numeral symbol is probably a remnant of a corrupt Greek legend

The coin now figured by Cunningham is from Ajōdhyā.

My treatment of the Gupta coinage has always been defective in one important respect I had no opportunities for procuring assays or analyses of the metal, and consequently could not give any definite facts concerning the degree of its purity. Cunningham has caused the necessary experiments to be made, and has compiled (p. 16) an interesting table showing the weight and purity of the Gupta gold coinage, as compared with the *aureus* of Augustus and the Great Kuṣān and

Little Kuṣān (Indo-Scythian) coins. The general result may be given in the author's words —"The coins of all the earlier kings give an average weight of 123 grains, of which 107 grains are pure,[1] while 64 coins of the Kuṣān kings Wema Kadphises, Kaniṣka, Huviṣka, and the earlier specimens of Vasu Dēva, give exactly the same average. The later coins of Vasu Dēva show a falling off in the pure contents of nearly 10 grains. But towards the end of Skanda Gupta's reign,[2] the Gupta gold coins became much heavier, reaching an average of from 144 to 146 grains, while the pure contents were decreased to less than 70 grains. The coins of Nara Siṃha Gupta of this standard are thus only one-half gold, and are, therefore, worth only two-thirds of the earlier Gupta *dīnārs*. A singular exception is the money of Prakāçāditya, of a bright yellow colour, which contains 121·7 grains of pure metal out of 146·4.[3] At present I cannot even guess the reason of this strange freak. The single coin of Jaya Gupta is still more debased, the pure contents being only one-fifth of its weight. I take it to belong to a much later date."

The purity of the coinage of Prakāçāditya shows that the revival of the ancient Hindū *suvarna* standard of 144 to 146 grains was a reality, and that the extra weight of the heavy coinage initiated by Skanda Gupta was not merely a compensation for excess of alloy.

PART IV.—THE COINAGE OF THE LATER KUṢĀNS (INDO-SCYTHIANS).

Section I. GREAT KUṢĀNS.

Section II. LITTLE KUṢĀNS.

Essays, replete with learning, prepared by the late Sir Alexander Cunningham towards the close of his life, and published in the *Numismatic Chronicle* for 1893, and the *Transactions of the International Congress of Orientalists* (London, 1892), have done much to elucidate the very obscure and perplexing history and coinage of the so-called Later Indo-Scythians.

The term Later Indo-Scythians is vague and inconvenient, and has come into use merely as a cloak for ignorance. It will, I hope, be superseded in time, as knowledge advances, by more definite and suitable terms. The adjective Later is intended to distinguish the minor Indian dynasties of Central Asian origin during the period A. D 200 to 600[1] from the Early Indo-Scythians—the great imperial line of Kaniṣka, Huviṣka, and Vasudēva, and their forerunners

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[1] The coins of Kācha are the worst among the issues of the earlier kings. The figures for him are —Full weight about 123, highest weight 118·5, pure gold 102·5; alloy 20·5, equivalent to 16·66 per cent. (V. A. S.)

[2] Skanda Gupta's King and Queen coins are *dīnārs*, his Kramāditya coins are *suvarnas*. [V. A. S.]

[3] Equivalent to 16·64 per cent. of alloy, a return to the standard of Kācha. The personal name and date of Prakāçāditya are not known. [V. A. S.]

The Later Great Kuṣān chiefs, who are included among the Later Indo-Scythians, seem to extend from about A D 200 to A.D. 425 or 430

The Little Kusāns occupied the throne of Gāndhāra from about A D 430 to 500, and seem then to have been driven by the White Huns back into Chitrāl and the neighbouring territories

The Ephthalites, or White Huns, are first heard of in India during the reign of Skanda Gupta, about A D 470, and seem to have been the dominant power in Northern India during the first half of the sixth century.

Cunningham's essays are extremely difficult reading, and are not universally accessible I have, therefore, thought it worth while to try and present some of his principal results in a convenient and intelligible form. My special subject, the Gupta Dynasty from Candra Gupta I to Skanda Gupta, can no longer remain isolated It must be considered in connection with its contemporaries and successors

In a restricted sense the term "Gupta Period" may be interpreted to mean only the period extending from the accession of Candra Gupta I to the death of Skanda Gupta, or about A D 320 to 480 In a more extended sense it may be taken to comprise the three centuries from A. D 300 to 606, when Harsa Vardhana became the chief power in Northern India and founded his era. When the term is taken in this more extended sense, all the coinages of the Later Indo-Scythians, except the earlier issues of the Later Great Kuṣāns, fall within the Gupta period.

During the whole of these three centuries coins form almost our sole authority for the history of the Pañjāb, the chief supplementary sources of information being the meagre notes of Fa-Hian and Sung-yun The Pañjāb seems never to have been included in the Gupta Empire.

For the history of the North-Western Provinces, Oudh, and Bihār the materials are considerably more ample, inasmuch as the numerous Gupta inscriptions on stone and metal supply a record more detailed than that which coins can furnish The culminating point of the Gupta Empire may be placed approximately in the year A D 410, when Candra Gupta II had completed his conquest of Mālwā and

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[1] Dates are given in round numbers without any pretension to minute accuracy

Gujarāt. No indications of decline, so far as I am aware, are discernable in our records of the reign of Kumāra Gupta I The fierce conflicts with the Huns recorded in the Bhitarī inscription of Skanda Gupta appear to have been the immediate cause of the break up of the Empire

These preliminary observations will, it is hoped, help to make more easily intelligible the perplexing coinages of the Later Indo-Scythians

Cunningham classes the Later Indo-Scythians in three main groups —

I The Later Great Kuṣāns
II. The Later Little Kuṣāns
III The Ephthalites, or White Huns[1]

Coins of all these three groups exist in considerable number and variety.

Section I THE LATER GREAT KUṢĀNS

The coins of the later kings of the Great Kuṣān tribe (Ta-yue-ti of the Chinese, Tuṣāra of the Hindu, and Tόχαροι of the Greek writers), "formed the money of the Kābul valley and the Pañjāb from the time of Vāsudēva's death, or about A D 180 or 200, down to the settlement of *Kidāra Shāh*, or *Ki-to-lo*, in Gāndhāra, about A D 425

Ki-to-lo, the king of the Great Kuṣāns, established his son in *Purushāwar*, or Peshāwar, and thus formed the kingdom of the *Little Yue-ti*, or Lesser Kuṣāns"[2]

The coins of the Later Great Kuṣāns are divided by Cunningham into two classes, characterized as follows —

Class A

A numerous series of gold coins bearing the names of Kaniṣka or Vasudēva[3] in Greek letters on the margin, always accompanied by Indian (Nāgarī) letters in the field outside the king's spear or trident, and generally by other Nāgarī letters on the left, near the king's right foot, and in the middle between the king's feet.

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[1] Cunningham's papers on the Later Indo-Scythians include one on the Scytho-Sassanians (*Num Chron* for 1893, p 166), but the connection of the Scytho-Sassanian coins there described by him with India is so remote that I pass them over

[2] *Num Chron*. for 1893, p 115

[3] Cunningham invariably writes *Vāsu* with the long vowel The coins figured by him, and every coin which I have seen, give the name under the king's arm as वसु *Vasu* The full name *Vasudēva* does not occur in Nāgarī characters I use the term Nāgarī to mean any form of the Sanskrit alphabet Cunningham uses the inconveniently vague term "Indian" The general description of each class of coins is compiled from several passages in Cunningham's essay

Obverse. King standing, as in the earlier coins, with his right hand extended over a small altar, and holding in his left hand either a spear or a trident.

Marginal legend in modified Greek characters, *Ṣaonano Ṣao Kaneṣko* (or *Bazodēo*) *Kosano*, 'The Kuṣān King of Kings, Kaneṣko (*or* Bazodēo.)'

Reverse. Either the throne-seated goddess Ardokhṣo (Lakṣmī), with her name, or the god Okṣo (Çiva), standing in front of the bull, with his name The reverse name legend is always in modified Greek characters. Monogram Nāgarī letters occasionally occur on the reverse.

When the reverse has the Okṣo device the king carries the Çaiva trident. When the reverse device is Ardokhṣo, the king carries a spear. The Lakṣmī coins are those of the eastern provinces, and are found chiefly in North-Western India. The Çiva coins are found chiefly in the Western Pañjāb and the Kābul valley.

The interpretation of the brief Nāgarī legends on this class of coins is quite uncertain Cunningham has classified the known forms, but concerning their interpretation can only say that "On these gold coins I think it probable that we have the names in monogram of some of the first successors of the great Kushān princes, Kanishka, Huvishka, and Vasudēva. On some coins the names may perhaps be those of the satraps or governors of particular provinces In this case I should expect to find the name of the province, or city of the satrap, in addition to his name."[1]

These legends include sixteen monosyllables, namely, *Bha*, *Bhṛ*, *Cu*, *Chu*, *Ga*, *Ha*, *Khu*, *Nya*, *Pa*, *Pu*, *Ru*, *Sa*, *Si*, *Thā*, *Vai*, and *Vi* , and three dissyllables, namely *Mahi*, *Vasu*, and *Vīru*, in the Ardokhṣo reverse class , and seven monosyllables, namely *Aum*, *Ga*, *Ghō*, *Ha*, *Hu*, *Phri*, *Pri*, and *Thā* , and two dissyllables, *Rada*, and *Raju* in the Okṣo class.

Dr. Hoey possesses a specimen in good condition similar to Cunningham's Plate viii, 8 The reverse device is *Ardokhse*, and the obverse legends in field are *Vasu* outside spear, *Ga* between king's legs, and *Bha* at his right foot.

Another coin in the same cabinet (Plate VI, fig. 12), though not represented in Cunningham's lists, would seem to belong to Class A of the coinage of the Later Great Kuṣāns.

Obverse.—Over king's left shoulder a wheel or disk, which may perhaps, be the top of a standard. Marginal legend in Greek characters,

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[1] *Num. Chron.* for 1893, p. 119.

Nono sao koṣono Outside spear, vertically, a name in Nāgarī characters which seems to be *Magra*

Reverse Throned goddess, and remains of illegible legend

I cannot find any published notice of a coin like this

The coins of Class A are evidently earlier than those of Class B, about to be described, and probably are to be ascribed for the most part to the third century A D. The mechanical execution is good and clear, though the style is stiff and conventional

LATER GREAT KUṢĀNS—*Class B.*

The coins of this class are chiefly of gold, and some of the scarce copper specimens are ancient forgeries of gold coins

Greek letters, if present at all on the obverse, are reduced to a meaningless repetition of *O* They have completely disappeared from the reverse Frequently, there is no trace of Greek letters The obverse Nāgarī legends occur in three places, *viz*, (1) outside spear, (2) under king's arm, (3) near the altar, below his right-hand. There is no letter between the king's feet

The reverse device is invariably that of the throned goddess. Her name is not given, as it is in Class A. In some cases, one or two Nāgarī characters are inserted between her left arm and the margin.

The name under the king's arm must be that of the issuing prince, probably, in general, a local governor or satrap It is often a monosyllable, *e.g*, *Mi*, *Bha*, but is sometimes a Hindū name, *e g.*, *Samudra* The coins with monosyllabic Tartar names may be considered earlier than those with Hindū names It must have required a considerable time to Hinduize the invaders Cunningham believes the names outside the spear to be those of provinces Thomas preferred to interpret them as names of tribes At present, it seems impossible to prove either interpretation [1] Cunningham remarks that "all these coins are found in the Northern Pañjāb" They are also found in the North-Western Provinces, if we may class in this group the numerous *Kidara Kusana* coins, of which 62 were found in the Bijnor District in 1888.[2]

These coins, which are of a common type, occur both in gold and copper (? brass). The name under the arm may be read as कद *Kada*, कदि *Kadi*, किदु *Kidu*, and किदार *Kidara*, on various specimens. The word outside the spear is certainly कषण *Kasana*, which Cunningham interprets as *Kuṣāna.* The letter near the altar is often स *sa* Occasionally there is a character on the reverse, which on a specimen in my possession (brass) may perhaps be read as *Lō*

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[1] *Numismatic Chronicle* for 1893, p 120, *Indian Antiquary* vol. xii, pp. 6–11.

[2] Described by Dr. Hoernle in *Proceedings, A S. B.*, for 1888, p 205

The name *Kidara* [1] under the king's arm seems to require the classification of these coins with those of the Little Kuṣāns, or Kidarites, which will presently be noticed, but the coins now under discussion seem to be of much earlier date. Cunningham figures one of these coins (*Num Chron* for 1893, Pl XV, 3), and describes it (*p* 199) as follows—"*AV* Diam 85 'Wt 118

Obv King standing to left, as on the earlier Kushān coins of Kanishka and his successors Indian letters or monograms in three places To right, *Kushāna*, under king's arm, *Kidāra*, to left, *Kapan* (? for *Kophene*). I conclude 'The Kushān king Kidāra of Kapan'

Rev. The goddess *Ardokhsho* (Lakshmī) seated on throne with cornucopiæ in her left hand. I found a duplicate of this coin in the Baotipind Stūpa, to the north of Hadon (*sic* ? Hasan) Abdāl"

Cunningham includes this coin in his Little Kuṣān plate

The other Kidarite coins, which he describes and figures, are much ruder in execution and have different legends

Cunningham also describes Later Great Kuṣān, Class B, coins, which have the name *Kirada* (not *Kidara*) under the arm, but these coins have the word *Gadahara*, and not *Kasana*, outside the spear. The *Kidara-Kasana* coins appear to me to belong to the same class as the *Bha Saka*,[2] *Samudra Gadakhara*, and other pieces which Cunningham groups together as Class B of the Later Great Kuṣāns The devices are executed in sharp, clearly-cut relief, and show little or none of the degradation which characterizes the other Kidarite coins in Cunningham's plate XV I do not think it possible that the well-executed *Kidara* coins can be so late as A D. 430, the approximate date of the occupation of Gāndhāra, by *Ki-to-lo*, the Little Kuṣān Chief Cunningham always assumes that the Chinese name *Ki-to-lo* is identical with the *Kidara* of the coins. But the identity does not seem to be proved. Even if the names are identical, it is quite possible that the name or title *Kidara* may have been in use among the Kuṣāns long before A. D. 430

I am inclined to think that the well-executed *Kidara-Kasana* coins are as early as A. D. 300 or 350, and that they are approximately contemporaneous with the *Bhṛ-Saka*, *Kirada-Gaḍahara*, *Bhadra-Pakalhdhi*, and similar coins grouped together by Cunningham as Class B of the Later Great Kuṣāns.

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[1] Cunningham writes *Kidāra* I cannot find the long *a* Thomas writes *Kidara*

[2] Cunningham writes *Sāka*, but I cannot find any trace of the long vowel. Thomas writes the word with the vowel short.

The question of the date of these coins requires further investigation.

Section II LITTLE KUṢĀNS (*Kidaritai*)

The Little Kuṣāns were a branch of the Great Kuṣāns, and occupied Gāndhāra in or about the years A D. 425–30,[1] under a leader called *Ki-to-lo* by the Chinese, who is supposed to be the *Kidara* of the coins

About the end of the fifth century, the Little Kuṣān chiefs of Gāndhāra were driven out by the White Huns or Ephthalites, under Lae-lih, and obliged to retreat into neighbouring regions They probably ruled in the country to the west of Kāçmīr — in Shāh-dhērī and Mansērā, to the east of the Indus, and in Yasin and Chitrāl to the west of the river[2]

The Kidarite, or Little Kuṣān, coins of the fifth century occur in gold, silver and copper.[3]

The rare silver coins are broad, thin pieces, resembling the Sassanian coins of Persia Some bear a date, read by Cunningham as 339, probably equivalent, according to the Çaka reckoning, to A D 417, a little before the conquest of Gāndhāra

The gold, and most of the copper coins, are rude imitations of the ordinary Kuṣān coinage, with the sacrificing king on the obverse, and the seated goddess on the reverse

Greek legends have completely disappeared.

The word *Kidara*, more or less complete, is always found below the king's left arm, and seems to be used as a general dynastic name

In some cases, letters occur below the king's right hand, but there is no vertical legend outside the spear

The reverse margin presents various names, *Kidara*, *Kṣatrapa Tarīka*, *Çrī Viçva*, *Çrī Kṛtavīrya*, *Çrī Silāditya*, *Çrī Kusala*, and *Çrī Prakāça* , as read by Cunningham

Dr Hoey has a coin which seems to belong to this series, though not included in Cunningham's lists

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[1] Von Gutschmid (quoted by Stein, *Zur Geschichte der Çahis von Kābul*, Stuttgart, 1893) gives the date as A D 480

[2] *Numismatic Chronicle* (1893) p. 190.

[3] The detailed catalogue is given, *ibid.*, pp 199–202,

The name under the king's right hand is clearly काच *Kaca*, with doubtful traces of two preceding characters.

The symbol 8, which may be the numeral 100, is near the right reverse margin. It is possible to read this character, or symbol, as स *sa*

It will be useful to give the principal references for the Later Kuṣān Coins, in addition to Cunningham's paper.

Prinsep's Essays (*Thomas.*).—

Plate xxii, 4. Later Great Kuṣān, Class A, Okṣo rev.
Do. do 11 ditto ditto Lakṣmī (Ardokhṣo) rev.
Do do 12 ditto ditto ditto
Do do 13. Little Kusān (or ? Great Kuṣān, Class B).
Do. do 14 Later Great Kuṣān, Class B
Do do. 15. Little Kuṣān, rude, late.
Do. xxix, 10 Later Great Kuṣān, Class A.
Do. xxx, 16, 17, 19, 20. Little Kuṣān.
Do do 18 Later Great Kuṣān, Class B. (?)
Do. xxxi, 4 ditto ditto ditto.
Do. do. 2, 3, 5, 6, 7, 9 Little Kuṣān, rude, late.

Proceedings As. Soc Bengal —

1885, p 129 5 Little Kuṣān coins from Gurdāspur District One *Vasu*, Later Great Kuṣān, Class A, from Bhāgalpur District
1888, p 132. Pl iv, 7, 8 Later Great Kuṣān, Class B.
Do 9 Little Kuṣān.
Ib p. 180, and woodcut, p 183 57 very debased Little Kuṣān-type coins of Yaçōvarmman, *circa* A D. 532
Ib. p 205. 62 Later Great Kuṣān coins, Class B, from Bijnōr District (or ? Early Little Kuṣān)
1890, p 178. 25 Little Kuṣān coins from Rāwalpindī, (similar to the Bijnōr coins)
Ib. p 179. Ditto ditto from Hardōī, in Oudh, (same as Prinsep, Pl. xxx, 19)
1891, p. 65 Three more Little Kuṣān coins from Hardōī, apparently, like the others, of Kṛtavīrya.
One ditto of *Çrī Cacca* (श्रीचच)

Indian Antiquary, Vol. XII. p 6, *Indo-Scythian Coins with Hindī Legends*,[1] with wood cuts (Thomas)

Twelve Kuṣān coins are described in the paper by Thomas. No 1 is a *Vasu* coin of the Later Great Kuṣāns, Class A, Ardokhṣo or Lakṣmī device. No. 11 *a*, a *Mahi* coin, is to some extent intermediate in character between Class A and Class B. Cunningham (*Num Chron* for 1893, p. 121) classes it in A.

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[1] By the odd phrase "Hindi legends" Thomas meant legends in the ancient Sanskrit (Nāgarī) character

The remaining coins, Nos 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11, belong to Class B of the Later Great Kuṣāns, if the *Kirada Kasana* coins (No 8) may be so classed[1] (See *ante*, p 181).

The later Indo-Scythian coins are further discussed from an historical point of view by Thomas in his short paper, entitled *Extracts from Chinese Authors concerning the History of the Kushans*, in the *Indian Antiquary*, Vol. XV, p 19, which is based on M Edouard Specht's treatise, entitled *'Etudes sur l'Asie Centrale, d'après les Historiens Chinois*, in the *Journal Asiatique* for 1883 Further references to the *Ariana Antiqua* and other books will be found in the papers cited above

The heading *Coins, Indo-Scythian (later)*, in my *General Index to the Archæological Reports*, is unfortunate, though not altogether erroneous It is used there to distinguish the Indo-Scythian coins proper, from the coins described by Cunningham in pages 58–60 of Volume II of the *Reports*, which include the coins of Azes, Vonones, Gondophares, and others These princes may be called "Early Indo-Scythians," and so distinguished from the Kadphises kings, and the line of Kaniṣka, who may be called "Later Indo-Scythians" This is the sense in which the term "Later Indo-Scythians" is used in my *Index*. The references under this heading mostly, if not all, refer to coins of Wema Kadphises, Kaniṣka, etc., and not to the coins now under discussion

The term Indo-Scythian has become an encumbrance and a hindrance to exact knowledge It is a pity that Sir Alexander Cunningham has given the sanction of his great name to the continued use of such a misleading and confusing term

PART V.—THE INDIAN COINAGE OF THE EPHTHALITES OR WHITE HUNS, AND THE GUPTA SILVER COINS

Section I—THE WHITE HUNS.

The important part played by the White Huns in the history of Northern India during the fifth and sixth centuries of the Christian era has only lately been recognized by historical students This Central Asian tribe, which first appeared in the countries on the Oxus in the beginning of the fifth century, is known by a most inconvenient variety of names The Chinese writers call them Yuan-yuan, Yetha-i-lito, Yetha, or Himatala (Hiuen Tsiang). The Greek historians knew them as Οὖννοι, Λευκοὶ Οὖννοι, Εφθαλίται, or Νεφθαλίται. The Armenians call them Hunk, and in Sanskrit authors they are named Hūṇa (or Hūna), Sita Hūna (*Bṛhat Samhitā*, xi, 61), Çvēta-Hūṇa (*ibid*, xvi, 38), or Hāra-Hūna [1]

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[1] The paper treats of 14 coins in all. One is a coin of Nara Bālāditya, and another is a coin of Viṣṇu Candrāditya.

The earliest Indian inscription which mentions the Huns is the Bhitarī inscription of Skanda Gupta, *circa* A D. 470, which records (1 15), the fact that the king "joined in close conflict with the Hūṇas" (*Gupta Inscr*, p 56.) The Mandasōr inscription of Yaçōdharman, king of Northern India, *circa* A D 535, alleges that his prowess was displayed by invading those parts of the earth, "which the command of the chiefs of the Hūnas, that established itself on the tiaras of many kings, failed to penetrate" (*ibid*, p 148) The inscription of Ādityasēna, king of Magadha, mentions the defeat by Dāmōdara Gupta (*circa* A D 565), of the Maukharis, who had themselves defeated the Hūnas (*ibid*, p 206.)

These records show that, during the first half of the sixth century and the latter part of the fifth, the invading and aggressive Huns were in constant conflict with the Gupta and other native kings of Northern India.

The Indian history of the White Huns begins with a chief called Lae-lih by the Chinese, who established himself on the Indus near the close (*circa* A D 470–480) of the fifth century

The son of Lae-lih appears to have been Tōramāna [2] Two inscriptions of this king are known The inscription on the boar statue at Ēran in the Sāgar District of the Central Provinces is dated in the first year of his reign (*Gupta Inscr.*, p 159) The second inscription, which was found recently at Kura in the Salt Range, calls him Mahārāja Tōramāna Sāha Jaūvla, and has been edited by Dr Bühler (*Epigraphia Indica*, Vol I, p 238). Dr. Buhler denies the identity of this prince with the Tōramāna of the Ēran record, but Cunningham has no doubt of the identity, and I think he is right

Tōramāṇa succeeded in extending his dominion over a wide area, including the Pañjāb, Kāçmīr, Mālwā, and a considerable portion of the North-Western Provinces

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[1] Most of the above synonyms are given by Cunningham (*Trans Intern Congress of Orientalists*, 1892, Vol. I, p 222), but he makes a slight error in asserting that "by the Indians they are always called *Hūna* or *Hāra Hūṇa*" The references to the Bṛhat Samhitā of Varāha Mihira are given in Dr Fleet's valuable paper entitled *The Topographical List of the Bṛhat Samhitā* (*Indian Ant.*, Vol XXII (1893), pp 169–195) Hūna हून is a various reading for Hūṇa हूण.

[2] The name Tōramāṇa is not Indian. It is supposed to be connected with the Turkish word *turamān*, meaning a 'rebel' or 'insurgent.' (*Epigr. Ind. l. c*).

He was succeeded about the year A D 515, by his son Mihirakula (Mihirgul),[1] who is mentioned under that name by Hiuen-Tsiang and the author of the Rāja Taraṅgiṇī. He must be identified with Gollas the king of the Indian White Huns mentioned by Kosmas Indikopleustes (A.D 522–530), and with the unnamed Ephthalite king of Gāndhāra visited by the Chinese envoy Sung-yun in A D 520. He seems also to be the person called Hunimanta, king of Persia, and ruler over Lāhōr and Multān, by Tārānāth, the historian of Buddhism.

The Mandasōr inscription of Yaçōdharman, already referred to, asserts that Mihirakula did homage to Yaçōdharman, and an inscription at Gwālīōr is dated in the fifteenth year of Mihirakula, the son of Tōramāna (*Gupta Inscr*, pp 148, 150, 161)

The reign of Mihirakula ended about A D 544–550 I will not at present stop to examine critically the conflicting, and in great part mythical, accounts of the alleged events of his reign It seems to be the fact that about A D 544 he was defeated by a coalition of Indian princes, driven out of India proper, and compelled to retire to Kāçmīr and the neighbouring regions

The above sketch will suffice for its purpose on this occasion, which is merely to indicate approximately the dates and historical position of the coinage of Tōramāna and Mihirakula

The coins of both these princes require much further examination and elucidation before they can be arranged satisfactorily The leading and most recent authority on the subject is Cunningham's already cited paper in the Transactions of the Congress of 1892. Unfortunately, it has been published without the plates which were intended to accompany and illustrate the text[2] The notices of the coins in Cunningham's dissertation are mixed up with much extraneous matter I shall endeavour to make the subject somewhat clearer and more intelligible by disentangling the numismatic facts, and adding what I can from other sources But my readers will please clearly understand that the present attempt to describe the Indian coinage of Tōramāṇa and Mihirakula is merely preliminary and tentative

The coins of both kings occur in both silver and copper, and are not certainly known in gold, though it is probable that many of the rude imitations of the Gupta gold Archer coins are of White Hun origin. The main characteristic of the White Hun coinage is its want of originality The White Huns were a rude and unlettered people,[1] and they were generally content to imitate as well as they could the coins of the various countries which they over-ran The result is that the Hun coinage occurs in widely varying forms, Persian, Parthian, Indian and Indo-Roman.[2]

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[1] This date is certainly approximately correct. (Fleet, *Ind Antiq*, Vol XV, p 252)

[2] I understand that it is likely that the plates will appear in the *Numismatic Chronicle* (During the passage of this paper through the press, the plates have appeared in the *Num Chron* for 1894). Many of the White Hun coins are figured in Plates xxxiii, and xxxiv of Thomas' edition of Prinsep's *Essays*.

Section II.—TŌRAMĀṆA, SILVER COINS.

'In one passage Cunningham divides the silver coins of Tōramāṇa into two classes as follows —

I —Broad thin pieces of Sassanian type.

Obv King's head, with a club in front of the face. Legend in Gupta characters, *Sāhi Jabubla* or *Jabula.*

Rev Traces of fire-altar and its attendants.

II Small hemidrachms, exactly like those of the Fantail Peacock type of Kumāra Gupta I, Skanda Gupta, Budha Gupta, Bhīma Sēna, and Içāna Varman, except that Tōramāna's head is turned to the left

But this division of Tōramāṇa's silver coins is not exhaustive. In a later page Cunningham gives details which show that three main types of Tōramāna's silver coinage are known These are—

i Horseman.
ii Sassanian Bust.
iii Fantail Peacock hemidrachms.

I proceed to describe each class

I.—Horseman Type.

Obv. Horseman to right Discus and shell of Viṣnu, or (?) vase, in field Ephthalite symbol behind horseman. Marginal legend in Gupta characters *Sahi Jabula* on one specimen, and apparently *Sahi Janabula* on the other

Rev The usual fire-altar and supporters, rudely executed. Diam. ·90 and 80 Wt 53 and 50 5[3]

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[1] So Cunningham: "the illiterate White Huns" (*Trans*, p 284). Gibbon, whom he cites, gave them the epithet of "polite" (*Ch* 42), but their rudeness is vouched for by Sung yun, who visited them both in Central Asia and Gāndhāra.

[2] The silver coins follow Persian and Parthian models, the copper pieces are mainly Indian; and the gold (if any gold coins are Hun issues) copy the Gupta coinage, which may be concisely characterized as Indo-Roman

[3] Cunningham's coins, each of which he believed to be unique, are figured in *Num Chron* for 1894, Pl ix (vii), fig. 8, 9.

The coins described by Cunningham, appear to be the only two specimens known. But a very similar coin is described and figured in Prinsep's *Essays*, Pl. xxxiii., 1. The description of this piece is as follows —

Obv. Horseman to right; crescent over head, Ephthalite symbol behind horseman, vase over horse's head Marginal legend supposed to be Pahlavī, but probably Greek (*Num Chron* for 1894, p 277)

Rev. Indistinct, probably fire-altar and supporters.

This coin was in Prinsep's cabinet The find-spot is not stated. Weight not stated. Diam 1 inch It closely resembles Cunningham's fig 9

Cunningham's coins are ascribed to Tōramāṇa the White Hun, on account of the legend *Jabula* or *Janabula*, which seems to be identical with the Jaūvla (जऊव्लः) of the Kura inscription of Mahārāja Tōramāna Ṣāha Jaūvla. But the title Jaūvla may be "a tribal name or *biruda*,"[1] and its occurrence on a coin does not necessitate the ascription of that coin to Tōramāṇa The coin might possibly be his father's, or his son's. But it is, most probably, assigned rightly to Tōramāna

II —Sassanian Bust Type

Obv. Bust of king to right, with a cap adorned with a crescent in front. Marginal legend in Gupta characters, षाहि जबूव्लः, *Ṣāhi Jabūvlaḥ*, or जबुल *Jabula*

Rev Indistinct, the coin in one instance being *repoussé*. Diam. 1 and 1 10 Wt 56 and 50 5

Cunningham describes four or five coins of this class (*Num Chron.* for 1894, p 278, Pl. ix (vii), figs 10, 13) Similar coins are known of *Dēva Sāhi Khiṅgila* and of *Rājā La*[*khana*] *Udayāditya.*[2]

Dēva Sāhi Khiṅgila is identified with Khiṅkhila, who is mentioned in the *Rāja Taraṅgiṇī* as one of the kings who succeeded Mihirakula, and is said to have been also known by the Hindū title of *Narēndrāditya*[3] Copper coins of the period with the legend *Jayatu Çrī Narēndra* exist, and may have been issued by the same chief

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[1] Buhler, *Epigraph Ind*, Vol I, p 239

[2] Cunningham possessed only one coin of Khiṅgila (*Coins of Med. India*, p. 26) He dates him in A D. 580. He had four specimens of Udayāditya, and Mr Theobald has one.

[3] Cunningham describes and figures two rude gold coins of a king of Kāçmīr bearing the legend *Çrī Narēndra*, whom he identifies with the *Narēndrāditya* of the Rāja Taraṅgiṇī These coins are of the ordinary debased Kidarite type, with *Kidara* under the king's arm (*Coins of Med India*, p 43, Pl. iii, fig 5). This *Çrī Narēndra* seems to be distinct from *Khiṅgila Narēndrāditya.*

The obverses of two specimens of Udayāditya's coinage are depicted in very clear woodcuts (Nos 3 and 4, Vol I, p. 411) in Prinsep's *Essays* The legend is perfectly legible and unmistakeable, except for the second and third character of the second word. Prinsep read the word as *Lamata* Cunningham reads it doubtfully as *Lakhana* The first character is certainly ल *La*, and, in the woodcuts; the third character seems to be त *ta*, not ण *na* The medial character is dubious. It is unfortunate that the second word of the legend, which must be the real personal name, is doubtful *Udayāditya* appears to be a mere title, similar to the *Vikramāditya*, *Bālāditya*, and other titles of like formation assumed by the Gupta kings

Cunningham suggests that the Udayāditya coins may have been struck by Lae-lih, the father of Tōramāṇa [1]

A large class of anonymous coins, devoid of any kind of legend, should probably be arranged as a sub-division of the Sassanian Bust coins of Tōramāna

A hoard of 175 silver Indo-Sassanian coins found somewhere in Mārwāṛā was examined by Dr Hoernle The coins were of the ordinary Indo-Sassanian pattern, the obverse device being that of the king's bust to right, and the reverse that of a fire-altar with supporters.

These coins copy so closely the issue of Fīrūz, king of Persia from A.D 459–480,[2] while they omit his name, that they must be regarded as nearly contemporary imitations of his coinage Dr. Hoernle shows that the coins found in Mārwāṛā reproduce "every one" of the details which characterize the later period (*circa* A.D. 471–486) of the reign of Fīrūz, "though in somewhat cruder execution." The only exception is that the Mārwāṛā coins have no legend whatsoever These coins are readily divisible into two classes, one with the king's head of distinctly Sassanian type, and the second, much less numerous, with a king's head of rude, thick-lipped, barbarian type

Dr Hoernle's assignment of these uninscribed Indo-Sassanian coins to Tōramāṇa having been ignored by Cunningham, I had better give Dr. Hoernle's very cogent arguments in his own words —

"The age of the coins may be determined by their remarkably close imitation of Fīrūz's coins

They cannot be genuine coins of Fīrūz for two reasons, (1) because their execution does not quite come up to the standard of Fīrūz's known genuine coins, and (2) because they do not bear any Pahlavī legend At the same time they must be of Fīrūz's time, that is, of the latter part of the fifth century, A D , they cannot be of a later date, for in that case they would rather imitate Sassanian coins of Fīrūz's successors From the absence of any Pahlavī legend and Sassanide king's name, it may be concluded that the coins were not issued either by a Sassanide king, or by any of his vassals or governors. They must be the issue of some hostile king, who adopted Fīrūz's coinage, but omitted Fīrūz's name

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[1] *Trans*, p 228 The coin of Pūrvāditya (woodcut No 2) and others belong to the same class (Prinsep's *Essays*, *l c*, *Num Chron* for 1894, pp 285 *seqq*)

[2] Cunningham places the death of Fīrūz and his defeat by the Huns in A D 483 Gibbon (*chap* xl), gives the date as A D 488, and observes in the note that "the chronology has been ably ascertained by Asseman (*Biblio Orient*, iii, p 396)."

It is known from history that during the latter part of his reign Fīrūz was engaged in calamitous campaigns against the White Huns in which he lost his life The Huns annexed the eastern districts of the Sassanide kingdom (K͟horāsān and Kābul), and then passed on to the invasion of India

It was probably their leader, who about this time (A D 470–486) adopted Fīrūz's coinage. He naturally omitted Fīrūz's name, though he at first retained Fīrūz's likeness on the obverse (Class I) Subsequently he appears to have substituted his own likeness for that of Fīrūz (Class II)

At the time of the Hunnic invasion of India, their leaders were Tōramāna and his son Mihirakula The latter succeeded his father about A D 515, and Tōramāna appears to have had a rather long reign, so that he may have succeeded to the leadership of the Huns about A.D 470 or perhaps even earlier (See Fleet's Introduction to Vol III, of the *Corpus Inscriptionum Indicarum*, pp 10–12) His Indian campaigns, during which he conquered Kāçmīr, the Pañjāb, Sindh, Rājpūtānā and a portion of Central India, probably fell within the period A D. 490–510

In India it is known that he imitated the contemporary Gupta [silver] coinage, and he appears to have observed a similar practice in Kāçmīr It is, therefore, probable that he followed a similar course during the period of his conquest of portions of the Sassanide kingdom, and that the coins of the present find, the age of which coincides with that of Tōramāṇa, are issues of the latter king. They may have been carried by his advancing army into India, and thus be brought to the place where they have now been discovered

It is curious that these coins should bear no legend whatsoever, though Tōramāna's Indian, as well as Kāçmīrian, imitated coins are inscribed with his name

Perhaps the fact may be accounted for by the circumstance that his Sassanian imitations were his first attempt at coining money of his own. If my suggestion that these coins are issues of Tōramāṇa should prove to be correct, the barbarian head on the obverse of Class II, may be a portrait of Tōramāṇa himself "[1]

I think it probable that these anonymous coins were really issued by Tōramāṇa, as suggested by Dr. Hoernle. The king's head is so rudely executed in all the varieties that to call it a "portrait" is rather an exaggeration It seems to me a merely conventional delineation. Multitudes of rude coins of Sassanian type without legends have been found in Northern India, of which many may have been struck by leaders of the Huns. The coins of the hoard described by Dr Hoernle in detail are only remarkable because they imitate so closely the coins of one Persian king issued within the limits of a period of about sixteen years, and can, consequently, be dated with approximate accuracy, and assigned with probability to a particular Hun chief

I have some small size anonymous Indo-Sassanian coins which were found at Bhitarī between G͟hāzīpur and Benares. Some obtained at that place by Cunningham were assigned by him to the eighth or ninth century,[2] but I am inclined to think that they must be earlier Similar coins have been found at Indōr Khērā in the Bulandshahr District, associated with ruins of the Gupta period [3] A rude reminiscence of the Sassanian reverse device is found as late as A D 900 on the coins of Vigraha Pāla of Magadha [4]

Like most branches of Indian numismatics, the Indo-Sassanian series requires much more study and elucidation than it has yet received.

To return to Tōramāṇa.

III —Fantail Peacock Hemidrachm Type.

His hemidrachms with Fantail Peacock reverse exactly copy the Gupta coins of the same type, except that the king's head is turned to the left, instead of the right The only two specimens hitherto known, which are in the British Museum, have been repeatedly described and figured [1]

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[1] *Proc.*, *A S B*, for 1889, p 229 Figures of typical specimens of each variety of the hoard will be found in *Jour*, *A S B*, Pt i, Vol LIX, (1890), Pl v Some specimens from the hoard are now in the British Museum

[2] *Arch Rep*, Vol I, p 97

[3] *Ibid*, Vol XII, pp 44, 68

[4] *Ibid*, Vol XI, pp 175, 181, Pl. xliii. The coins with the Sassanian device evidently belong to the first Vigraha Pāla. His namesake lived about a century later See *Coins of Mediæval India*, pp 49 to 52.

Dr Hoey has been fortunate enough to acquire a third specimen, (now, I am sorry to say, mislaid) This coin is (or was) in good, though not brilliant, condition, and the legend (without vowel marks) is quite distinct, वजतावनरवनपत श्री तारमण, *vijitāvanir-avanipati Çrī Tōramāna.* The date is lost.

Three interesting coins in Dr Hoey's cabinet, which are of the same type as the hemidrachms of Tōramāṇa and the Guptas, deserve notice

No 1 (Pl VI, fig 13). *Obv.* Head to left, as in Tōramāna's coins Date, apparently in same era as Tōramāna's, 54. *Rev.* Fantail Peacock device Legend, with vowel marks विजितावनिरवनिप *vijitāvanir-avanipa.*—The rest, including the king's name, is, unfortunately, completely obliterated This coin is probably one of Īçāna Varman, (whose date, according to Cunningham, is *circa* A D. 560). A specimen of his coinage with the same date as Dr Hoey's coin is figured in *Coins of Mediæval India*, Pl. ii, 12 Although the date is quite plain, Cunningham notes it as "not read" This date in the unknown era for Īçāna Varman is of importance, both for determining the close of Tōramāṇa's reign in Magadha, and for fixing the era.

No 2 (Pl VI, fig 14) *Obv* Head to left, as in No 1, but the head differs On this No 2 coin, the king has a hooked nose Date, in same era, 58 *Rev* Fantail Peacock device. Legend, with vowel marks, विजितावनिरवनिपति श्री शर्व्व वर्म्म देव जयति, *vijitāvanir-avanipati Çrī Çarvva Varmma dēva jayati*

These two coins are closely related to three coins in the British Museum, concerning which nothing has been published except my brief remark (*Coinage*, p 136)—"There are three similar [*scil.* to Tōramāṇa's] coins with head to left, in B M, presented by Miss Baring, on two of which the date seems to be 54, but I could not decipher the king's name It did not appear to be Tōramāna." I regret that I did not examine these pieces more closely when I had the opportunity.

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[1] The references are —

Archæological Survey of W India (Thomas), Vol. II, p 36, Pl vii, 27, 28 This notice is reprinted in the volume entitled *Records of the Gupta Dynasty* (Trubner, 1876)

Archæological Survey of India (Cunningham), Vol. IX, p. 26, Pl. v, 18, 19.

Indian Antiquary, Vol XVIII, p 225 (Fleet)

J. Roy As Soc for 1889 (V A Smith), p. 136

Trans of Intern Congress of Orientalists (Cunningham), London, 1893, Vol I, pp 228, 229 *Coins of Mediæval India* (Cunningham), p. 20, Pl ii, 11. The author repeats the old error of reading *dēva janita* for *dēvō jayati.*

The two British Museum coins of Tōramāna are both certainly dated in the year 52 Dr. Hoey's coins now published add the dates 54 and 58 The legend on the coin dated 58 is damaged, and every letter of the king's name cannot be read with certainty But the name begins with श *Ça*, and I have no doubt that the reading above given is correct Çarvva Varman (Varmmā) Maukharī was the son and successor of Içāna Varman. The coin now published is the first which has been recognized as belonging to Çarvva Varman Dr Fleet has published a seal of Çarvva Varman (श्री शर्व्व वर्म्मा मौखरिः) in *Gupta Inscr.*, p 220, Pl xxx.

The era in which all three coins are dated is as yet undetermined

Dr Fleet's theory as to the 52 date is that it is a regnal year. "It is plain, therefore," he observes, "that Tōramāna did exercise sovereign sway in the Pañjāb, at the beginning of his career, and before he commenced the campaign in the course of which he eventually reached Mālwā If, now, we interpret the year on his coins as a regnal year, it certainly indicates a long reign But analogous instances could be quoted for this, and no special exception need be taken to it

"And this interpretation of the date is at any rate better than the assumption that it is reckoned from some period, anterior to Tōramāna's accession, at which his own branch of the Hūnas first rose to power, for that would mean that, not satisfied with the Çaka era, which was the hereditary and national era of that part of the country, and probably of his own ancestors also, he sought to establish a new era, dating from that event

"This, accordingly, is the interpretation that I place upon the date And, reckoning back from A D 515, which is very closely the latest terminal date that can be applied, it follows that the commencement of his reign, at his own capital in the Pañjāb, is to be placed approximately in A D 460"[1]

This interpretation, never satisfactory, is rendered impossible by the discovery of coins of other kings dated evidently in the same era, and must, in my opinion, for that, and for other good reasons, be rejected.

A suggestion of Cunningham's that the era used is the Çaka, with the hundreds omitted, is, for several reasons, equally untenable.

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[1] *Indian Antiquary*, Vol XVIII (1889), p. 229

The best solution of the problem yet offered seems to me to be Cunningham's alternative guess that the date is expressed in a special White Hun Era. "The only remarkable date in the history of the White Huns which I can suggest is the final expulsion of the Sassanians from the countries to the north of the Oxus by Chu-Khān in A.D. 456 or 457. If the year 52 be reckoned from this point, we get A.D. 508 or 509 for the establishment of Tōramāna's rule in Mālwā."[1]

I think it is tolerably clear that an era otherwise unknown is used on these coins, and it may be provisionally named the White Hun Era. The limiting dates for Tōramāna appear to be fixed with tolerable precision. Içāna Varman has been provisionally dated by Dr. Hoernle in A. D. 564. This date must apparently be moved back. If the Hun Era is taken as A. D. 456, then Içāna Varman's date (456 + 54) is A. D. 510. If the Hun Era is taken as A. D. 448, Içāna Varman's date will be A. D. 502. The subject requires further discussion, which I cannot at present undertake.

Dr. Hoey's third coin resembles the Gupta coins in having the king's head turned to the right, and in being evidently dated in the Gupta Era.

No. 3. (Pl. VI, fig. 15) *Obv.* Head to right, execution coarse, and in high relief. Date in three characters, of peculiar form which may perhaps be read as 166. The date of Budha Gupta's coin is 174 of the Gupta Era.

Rev. Fantail peacock device. The legend, which is difficult to read, seems to begin with विजि *viji*—, and to end with the name श्री हरिकान्त *Çrī Harikānta.*

Section III. COPPER COINAGE OF TŌRAMĀṆA.

The arrangement of the copper coins of Tōramāna presents many difficulties, which I am not yet in a position to solve. Some of the coins bearing the name of Tōramāna (or at least its first syllable, or first two syllables) may belong to a king of Kāçmir of perhaps later date than the White Hun chief. The exact date of this Tōramāna of Kāçmir is not known. In *Coins of Mediæval India* (p. 39), he is dated A. D. 520 and made to be contemporary with the White Hun chief.

Cunningham's remarks on the subject of the two Tōramāṇas are as follows:—

"With regard to the supposed identity of the Tōramāṇas of Eran and Gwalior [*scil.* the White Hun chief] with the Tōramāna of Kāçmir, which was originally advocated by Rājēndralāl and Bhāu Dājī,

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[1] *Trans.*, p. 228. See *post*, p. 208, M. Drouin dates the Hūn Era from A. D. 448.

I may say that I cannot conceive it to be possible for the following reasons —

1 The Tōramāṇa of Kāçmīr, according to the Rāja Taraṅgiṇī, was never a king, but died in prison, where he was put by his brother for striking the coins which we now possess The Scythian [*i e*, White Hun] Tōramāṇa was a powerful king, who ruled over the valley of the Indus, both Pañjāb and Sindh, and afterwards conquered Malwā, where small silver coins of Gupta type were struck in his name[1] and a colossal boar set up in the first year of his reign Eventually he left his kingdom to his son Mihirkul, who held it for at least fifteen years.

2 The son of the Kāçmīr Tōramāna was Pravarasēna, who is always described as a great conqueror, but if the two Tōramānas were the same, then Pravarasēna must have been Mihirakula himself

But there is this difference between the two that Mihirkul was eventually defeated by Yaçōdharman, king of Mālwā, whereas Pravarasēna re-established on his throne Silāditya, the expelled son of the king of Mālwā.

3 The coins of Pravarasēna, both in gold and silver, show him to have belonged to the Kidāra Kuṣāns, as they present the name of Kidāra in beautifully formed letters written perpendicularly, as on all the Kidarite coins

Lastly, I may observe that the earlier Tōramāna, like all the White Huns, has his hair cut short, while the Kāçmīr Tōramāna has bushy hair like his ancestor Kidāra, as copied from the Sassanian kings

4 I may also note that the characters of the Kāçmīr coins are of a later date than the others This is most clearly shown in the attached *ā* and *ō*, which are simple prolongations of the *mātrās* of the *t* and *m*, instead of marks placed above those letters, as in the Kyura [Kura] and Eran inscriptions of the other Tōramānas

I note also that the letter *r* has a turn up at the foot of the Kāçmīr coins of Tōramāna and his son Pravarasena, which is not found on the others "[2]

Some of the proposed tests are open to criticism, but I will not stop to examine them minutely Cunningham, it will be observed, regards the Tōramāṇa coins which he ascribes to Kāçmīr as the unauthorized issue of a pretender I confess that I feel sceptical as to the existence of two contemporary Tōramāṇas in Northern India in A D. 520.

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[1] I doubt if the Tōramāṇa hemidrachms were struck in Mālwā The Gupta coins of the Fantail Peacock type seem to have been struck in the Gangetic valley.

[2] *Trans*, p. 232.

The same author has discussed the coins of the Tōramāṇa of Kāçmīr at greater length in another place "There are other coins" he observes, "with the name of Kidāra which undoubtedly belong to Kāçmīr The earliest are the well-known copper pieces of Tōramāna, and the gold and silver coins of his son Pravarasēṇa. . As the existing coins of Tōramāna, which are found in considerable numbers in Kāçmīr, are confined to one class of copper pieces, ranging from 100 to 120 grains in weight, it seems not improbable that what Tōramāna did was to collect the old coins called *Bāla-hats*, and to re-coin them as *Dīnārs* in his own name . . The money thus re-coined, I take to have been the barbarous pieces of the later Kuṣān princes, whose names are unknown. These pieces vary in weight from 100 to 125 grains, with the king standing on the obverse, and Çiva and his bull on the reverse The coins of Tōramāna and his son Pravarasēna are so superior in execution to these coins and to all the contemporary coins of North-West India, that I look upon them as the first real issue of the Kāçmīr mint . I much doubt whether there was any previous coinage in Kāçmīr"[1]

Two of these Tōramāṇa coins of Kāçmīr are noticed and figured in Thomas' Prinsep, p 389, Pl xxxi, pp 13, 14

Obv Rude standing figure of king, with legend श्री तोरमा[ण] *Çrī Tōramā[na]*.

Rev Rude Lakṣmī, with legend जय *jaya* These coins are said to be common The king's figure is filled out in considerable detail, though roughly[2]

Certain *Tōra* coins, collected by Mr. Rodgers, which are now in the cabinet of Mr W. Theobald of Budleigh Salterton, exhibit a much more degraded form of the Standing King device, and cannot well be assigned to the White Hun Tōramāna, A D 500.

The Standing King of these coins (Nos 1 and 2) is reduced to the barest skeleton of a rude diagram. I annex sketches and descriptions[3]

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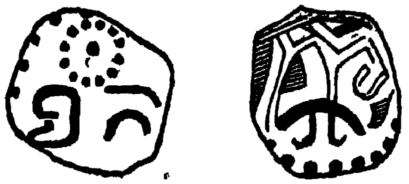
[1] *Num Chron* for 1893, pp 190–193

[2] One of these coins is in the Lahore Museum Weight 96 8, diam 8 Mr Rodgers also says that coins of this class are common (*Catalogue of Coins in Lahore Museum*, p 54) In *Coins of Mediæval India* Cunningham has described and figured two varieties of the Kāçmīr copper coinage of Tōramāna, of which one is very rare, and the other common Pravarasēna's coinage also is found in two forms, one in gold, and the other in silver (*Coins of Mediæval India*, pp 42, 43, Pl iii, 1–4)

[3] A coin very similar to No 1 has been published by Dr. Hoernle (*Proc As. Soc Bengal* for 1885, p 5, Pl I, 14) Among 60 coins from the Pañjāb, nearly all coins of Tōramāṇa and Mihirakula, there was only one specimen with the skeleton figure Dr Hoernle's description is as follows —

"*Obv.* Crude standing figure of king, facing to the front with left arm akimbo, its right resting on a spear or staff, somewhat resembling the figure on the later Indo-Scythian coins

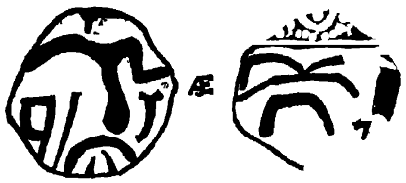
No 1.



No. 1. *Obv.* A very degraded standing figure Weight 41.

Rev Sun in upper field *Çrī Tō.* in lower field.

No 2



No 2 *Obv.* A very degraded standing figure, and the letters (?) गर Weight 62

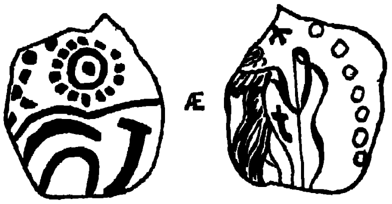
Rev Sun above horizontal line. Below, *Tōra* in large letters.

These two pieces must, I think, be classed with Kāçmīr coins

Another *Tōra* coin (**No 3**), sent home with the above, looks to me of earlier date

Obv. King standing, holding bow in left hand, as in Gupta coins. The only legend consists of two minute characters, तो *Tō* above the king's left shoulder, and रा *rā* or र *ra* below his left arm

No 3



Rev Sun above horizontal line Legend below line तोर *Tōra*, in peculiar bold characters. Weight 56

I am inclined to attribute this piece to the father of Mihirakula [1]

Mr Theobald's fourth piece is a larger coin than the last

Rev Wheel as in No 5 [Sassanian Bust *Tōra* coins], with some large marks looking like letters (perhaps बोधि *bōdhi*)"

Another coin in this style is figured in *Coins of Mediæval India*, Pl vi, 1, and vaguely assigned to a large class of "copper coins, which show Çiva and his bull on one side, and on the reverse a very rude representation of what appears to be a fire-altar with its two attendant priests Many of them bear single letters or names in early mediæval letters A large find of these coins was made at Rohtak, between the Satlaj and Delhi, ten years ago They probably formed the common copper currency of the Pañjāb and Rājputāna between A D 500 and 800"

[1] This coin has also been described and figured by Cunningham in his posthumous paper on the *Coins of the White Huns* in *Num Chron* for 1894, p 280, Pl ix (vii), fig 17 His description is inaccurate, omitting all mention of the minute characters on the obverse, which are quite plain on the original coin, and giving the reverse legend as *Tō*, instead of *Tōra* Cunningham agrees with me in ascribing this coin to the White Hun Tōramāṇa. The paper in the *Num Chron.* appeared while these

No. 4. *Obv.* Standing king to left, sacrificing at altar with right hand, resting on spear with left arm. Legend on left margin illegible.

Rev. Lakṣmī seated The only legible letters are रम *ṛam*, on right margin. Weight 98

This coin is evidently of comparatively early date, and may belong to the White Hun Tōramāṇa

The fifth coin is similar in type to the last Mr. Rodgers reads *Tōramāna* on left *obverse* margin, but this legend was not fully legible on the specimen submitted to me. The only letter visible on the *reverse* is *y*, probably part of *jaya* The form of the *y* is early

I am doubtful to whom to ascribe this piece

Cunningham's notices of the copper coinage of Tōramāna, the White Hun, are unfortunately very brief. They are as follows —

"The small copper coins attributed to Tōramāna are found both in the Pañjāb and in the country between the Satlaj and Jamna

"Their attribution is based on the type of the sun with the abbreviated name of *Tora* in large letters

"The same sun-type is found on the copper coins of Mihirakula, of which a few specimens show the bull struck over the solar emblem."[1]

"There is also a small class of copper coins which I would assign to Toramāna Jabula

"They bear a king's head of Sassanian aspect on the *obverse* and a *chakra*, or sun-wheel, on the *reverse*, with the Indian legend *Tora* in bold letters.

"The same legend is found on some of the smaller silver coins, with the name of *Zoboa*, or *Jabula* . . . . I observe that the peculiar symbol, which is rarely absent from any of the broad silver coins of these Ephthalite kings, does not appear on any of their undoubted Indian coins which are found in the Eastern Pañjāb and Rājputāna "[2]

These passages do not make it clear whether or not the learned author attributed to Tōramāna Jabula any coins other than those with the Sassanian head on the obverse

I have shown above that the sun symbol occurs on several types of *Tōra* coins

Other variations of the Standing King obverse, combined with a solar reverse, and characters of rather late type, which may be read as *Çrī Tōra*, will be found engraved in Plate xxxiv, 17, 18 of Thomas'

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sheets were passing through the press It is a reprint of the paper in the *Transactions*, with plates and a catalogue of coins added.

[1] *Trans*, p 229

[2] *Ibid*, p 287

edition of Prinsep's *Essays* Cunningham (*Num. Chron.* for 1894, p. 280) reads the legend on fig. 17 as *Shuta.*

These coins, other than the Sassanian-head pieces, seem to me to present many difficulties

The coins with the Sassanian-head obverse, alluded to by Cunningham in the second quotation above, must certainly be assigned to the White Hun Tōramāna, the father of Mihirakula

They have been described and figured by Prinsep, whose note may be quoted in full.[1] "Figs 15 and 16 of this Plate [xxxiii], and 6 of the ensuing one [xxxiv], are types of a distinct group of copper coins, plentiful in the Swiney and Stacy cabinets The appendage to the shoulder decides the Sassanian origin, and the wheel on the reverse seems to be borrowed from the emblem above the fire-altar I incline to think it the solar effigy, rather than the symbol of a *Chakravartin*, or ruler of universal dominion. It is probable that the common emblem is still preserved in the Ujjain and Indor coins on the present day.

There is the appearance of a letter in front of the face, but it is ill-defined

On the opposite side, however, the two large letters under the wheel are, most distinctly, तोर *Tōra*, the meaning of which remains a mystery. They are not in the same alphabet as that of the preceding coins, but of the more ancient *lāt* character which accords, so far, with the comparative superiority of the engraving"

I am not fortunate enough to possess any of these coins I annex a formal description of them, based on Prinsep's and Cunningham's plates and descriptions

TŌRAMĀNA (WHITE HUN.)

Sassanian Bust Type.—Æ.

Obv. Modified Sassanian Bust, facing right. An indistinct letter before face, read by Cunningham as बु, *Bu.* Dotted circle. The king seems to wear a close-fitting skull-cap.

Rev. In upper field a sun (wheel). In lower field तोर *Tōra*, in bold, splayed characters Dotted circle Diam., about 75 inch Weight of Cunningham's specimen, 57 grains.

The collection of 60 coins from the Pañjāb already referred to contained six of these pieces, which are described as follows by Dr. Hoernle.

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[1] *Thomas' Prinsep*, Vol I, p 416, Pl xxxiii, 15, 16, and Pl xxxiv, 6. The tail of the र *r* in these coins is turned up to the left, so that, according to Cunningham, they should be classed as issued by the later Tōramāṇa of Kāçmīr. I do not believe in the validity of the test.

"No 5 Six specimens. Plate I, figs 6, 7

Obv King's head or bust, facing right, with fillet behind, as on No 1, [*viz.*, 15 Bull coins of Mihirakula] In front of face, a symbol, resembling an angular shaped 9, which, if it be a graphic sign, may be read as *bra* or *pra*

Rev. Circular area, divided into two halves by a straight line; in the upper half a wheel within a circle of dots, in the lower half the two letters [characters] **तोर** *tōra*, in large bold Gupta characters of a late type "[1]

Circular dotted margins on both sides. Weight not stated Diam. of fig 7 is 75 inch Fig 6 represents a somewhat smaller coin

It is, I think, impossible to doubt that these Sassanian Bust coins were struck by Toramāna, the father of Mihirakula The division of the field into two portions by a horizontal line, with a symbol above, and the king's name below, is copied from the Gupta copper coinage. The Gupta kings inserted as the symbol their family crest, the Garuda bird, the White Hun, a sun-worshipper, uses his special emblem or crest, the sun's disk Cunningham observes (*Trans*, p. 229,) that "Tōramāna's preference for solar-worship is shown by his building a temple to the sun in Multān, and by naming his son Mihirkul "[2]

If it be admitted, as I think it must be, that the Sassanian Bust coins above described were struck by Tōramāna, the father of Mihirakula, it follows that Dr Hoernle must be mistaken in supposing that, in the case of certain double-struck pieces, the emblems of Tōramāna are superimposed on those of his son Dr Hoernle makes the admission that "on one specimen the emblems of No 1, [*scil* Bull type of Mihirakula] seem to be superimposed on those of No. 5, [*scil.* Sassanian Bust coins of Tōramāna], but this, being an exceptional case, may be an illusion "[3]

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[1] *Proc A S B*, for 1885, p 5, Pl i

[2] Cunningham identifies Tōramāna Jaūvla with the prince called Jabūīn, جبوين, in the *Chach-Nāma*, a history of Sindh, which states that Jabūīn built the temple of the sun at Multān Cunningham holds that this Jabūīn was the first of the *Ṣāhi* dynasty, and he obtains A D 505, as the date for the foundation of the sun-temple at Multān, by deducting 137 years, the duration of the *Sāhi* dynasty, from A D 642, the date when *Chach Brāhman* became king of Sindh (*Trans*, pp 226, 228, 229) For an account of the sun-temple at Multān, and Sassanian coins connected with it, see *Arch. Rep* Vol. V, pp 115–121, Pl xxxvii, and *Num Chron* for 1894, p 268, Pl x

[3] *Proc A S B*, for 1885, p 6

In 1885, when this remark was written, the relationship of the earlier Tōramāṇa to Mihirakula was not known, and Dr Hoernle was influenced by the statements of the *Rāja Taraṅgiṇī* concerning Tōramāṇa of Kāçmīr and his son Pravarasēna

Dr. Fleet is clearly correct in the observation —"Toramāna was the father and predecessor of the great Mihirakula himself. This will explain the double-struck coins published by Dr. Hoernle The Tōramāna of these coins must be the father of Mihirakula, not as was thought at the discussion of them, the later Tōramāna of Kāçmīr; and I feel sure that a re-examination of these coins will show that in every case the name and emblems of Mihirakula lie over those of Tōramāna "[1]

The result of this prolonged discussion is that only a single type of copper coins—that which I have named the Sassanian Bust, can with perfect certainty be ascribed to Tōramāna, the father of Mihirakula

I believe that the Archer coin (Theobald, No 3, *ante*, p 197) is also his. The other *Tōra* coins must for the present remain doubtful.

Section IV—MIHIRAKULA OR MIHIRAGULA, (*circa* A.D. 515–544)

SILVER COINAGE.

The silver coins of Mihirakula are exceedingly rare, in fact, only three specimens seem to be known

Sassanian Bust Type

Obv Bust of King to right, beardless, with crescent on front of head-dress Bull, or bull-standard, in front, trident behind Marginal legend either *Jayatu Mihirakula*, or *Jayatu vṛsadhvaja*

Rev Fire-altar and attendants, more or less distinct.

Variety 1.

Broad coin, about 1 inch in diameter, weight, according to Cunningham, 36 5 (which may be a misprint for 56 5) Standard in front of bust is an umbrella decorated with pennons, having a bull to left, recumbent on the top. Obverse legend **जयतु मिहिरकुल** *jayatu Mihirakula*, 'may Mihirakula be victorious.'

References and Remarks —

This coin was included in the Abbott collection, which was chiefly formed in the Hazāra country, and it is now in the British Museum. Thomas published a good woodcut of the obverse (*P E*,

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[1] *Ind Antiquary*, Vol XV (1886, p 245) Mr Rivett-Carnac, who sent the coins, also noticed that the bull was struck "above some former design" Cunningham, too, had no doubt that the bull was "struck over the solar emblem."

p. 411, woodcut No. 5) The obverse is in good preservation, and has again been figured in autotype by Cunningham in *Num Chron.* for 1894, Pl X (VIII), fig 3 The reverse shows only the remains of fire-altar and attendants nearly obliterated, and has, consequently, never been figured. This coin, which seems to be unique, is also described by Cunningham in *Transactions*, pp 231, 236, and in *Coins of Mediæval India*, p 27.

Variety 2.

Smaller than variety 1, diam about 90 inch, weight 56. Only bull in front of bust, the standard not being visible. Legend जयतु वृषध्वज, *jayatu vṛsadhvaja*, 'may the bull-standard be victorious.'

References and Remarks —

Two specimens of this variety are known, both in Cunningham's cabinet The better of the two is figured in *Num Chron.* for 1894, Pl VIII (X), fig 4. The coins are also noticed in *Transactions*, pp. 231, 236, and *Coins of Mediæval India*, p 27. It is not known where they were found

Thomas mentions a coin in Mr (Sir E C) Bayley's cabinet, with the legend *jayatu* and a trident, which was probably another specimen of Mihirakula's coinage Several other closely related coins are described by Cunningham in the *Num Chron* for 1894, p 281, *seqq.*

Section V.—MIHIRAKULA.

COPPER COINAGE.

The copper coins of Mihirakula, unlike his silver ones, are tolerably common, and are known in several sizes and types.

Cunningham's account of them is as follows —

"The small copper coins which are found in the Eastern Pañjāb and in Rājputāna are also [like the silver coins] of Sassanian type.

On the obverse is the king's head with the legend in Indian characters *Çrī Mihirakula*, on the reverse a humped bull with the Indian legend *jayatu vṛsa*, 'may the bull be victorious'

The middle sized copper coins are copies of the previous Kuṣān types—the king standing with a spear in left hand, and right hand held downwards over a small altar, legend in Indian letters, *Sāhi Mihiragula*, or simply *Mihirakula* *Reverse*, the goddess Lakṣmī seated, with cornucopiæ.

The large copper coins present the Rāja on horseback with the Indian legend *Mihirakula*, *reverse*—the goddess Lakṣmī " [1]

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[1] *Trans.*, p 231.

"Both peoples [*scil* Kuṣāns and White Huns] adhered to the old Kuṣān types for their copper money." [1]

"There are two distinct types of legend even in the Indian inscriptions. Thus, some coins of Mihirkul give him the simple title of *Çrī* preceding his name, while others have *jayatu Mihirakula* Others bear the Scythian form of *Ṣāhi Mihiragula*" "The former, I conclude, were struck in Kāçmīr, the latter either in Gandhāra or in Taxila" [2]

"His copper coins are not uncommon. The copper coins of the Western Pañjāb are all of the Kuṣān type, with the standing king and seated goddess Lakṣmī, but the few silver coins, and all the Eastern Pañjāb copper pieces bear a Sassanian looking bust of the king, with the bull and trident of Çiva His devotion to Çiva is also strongly marked by the legends of *jayatu vṛsa dhvaja* and *jayatu vṛsa* In the *Rāja Taraŋgiṇī* he is described as a persecutor of Buddhists" [3]

Facsimiles of two of the legends on Mihirakula's copper coins are given in Pl. xiv, D E, of *Num Chron* for 1893. These legends read (D), *Ṣāhi Mihiragula*, and (E), *Çrī Mihirakula*

The above quoted extracts show that Mihirakula's copper coinage occurs in three main forms, namely —

I —Horseman Type

Obv King on horseback to right Legend **मिहिरकुल** *Mihirakula*, "sometimes written in the wrong direction from right to left" (*Coins of Med India*, p 27)

Rev The seated goddess Lakṣmī Diam, 90, weight 110

The coins of this type seems to be very rare Cunningham possessed five specimens (*Num Chron* for 1894, p 282, Pl VIII (X), fig. 7)

II —Standing King Type.

Obv. Standing King with spear in left hand, and right hand held downwards over a small altar Legend either **षाहि मिहिरगुल** *Ṣāhi Mihiragula*, or simply **मिहिरकुल** *Mihirakula*

Rev Seated goddess Lakṣmī, with cornucopiæ.

These coins are described as "middle-sized," and are said to come from the Western Pañjāb Cunningham had five specimens of the *Ṣāhi* variety, weight 121 (*Num. Chron.* for 1894, p 281, Pl VIII (X), fig 5) He describes and figures (*ibid*, fig. 6) a single specimen of the *Mihirakula* variety, the legend on which is written from right to left There is a star or sun above the left shoulder of Lakṣmī.

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[1] *Ibid*, p. 285 The foregoing extract shows that *all* the copper coins are not Kuṣān in type.

[2] *Coins of Med India*, p. 27

[3] *Trans*, p. 287.

III —**Sassanian Bust Type.**

Obv. Modified Sassanian bust of king, generally to right

Rev Humped bull.

The varieties of this type being numerous, further details will be given in the descriptions of the several varieties The materials at the moment accessible to me do not suffice for the preparation of an absolutely exhaustive list of varieties, though I can indicate the principal variations. Perhaps the best leading line of division is furnished by the presence or absence of legends.

Class I—With legends.

Variety 1.—*Obv* Legend **श्री मिहिरकुल** *Çrī Mihirakula*, or **श्री मिहिरगुल** *Çrī Mihiragula*, in front of king's face

Rev Legend **जयतु वृष** *jayatu vrsa*, in exergue below bull Trident, or standard, in front of bull. Crescent over bull's rump Bull to left

References and Remarks —

P. E, Pl xxxiv, 4, 5[1] *Num Chron* for 1894, p 280, Pl VIII (X), fig 1

Proc. A S. B for 1885 No 1, pp 4, 5, Plate i, figs 1–4. Fifteen specimens, of which six are double-struck, apparently on coins of Tōramāṇa

Lahore Museum Several specimens, see Rodgers' *Catalogue*, pp 141, 142 The details given by him do not permit of minute classification of the minor varieties I have one specimen of this variety, bought from Mr. Rodgers, and it seems to be by far the commonest variety of Mihirakula's coinage Two of the fifteen specimens from the Pañjāb described by Dr Hoernle gave the king's name as *Mihiragula*, proving that the prefix *Çrī* is found with both forms of the name.

Variety 2.—Similar to variety 1, but the legend *jayatu vṛsa* is above the bull, instead of below it in an exergue

References and Remarks —

P E. Pl. xxxiv, 3 (Stacy) *Num Chron* for 1894, p 280, Pl. VIII (X), fig 2

Proc A S B, *l c*, No 4, 1 specimen.

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[1] P. E. stands for Thomas' edition of Prinsep's *Essays*, *l.* stands for left, and *r.* for right.

Variety 3 —*Obv.* Legend श्री मिहिरगुल *Çrī Mihiragula.*

Rev No trident before bull. Crescent replaced by a symbol resembling the letter *y* Legend below bull as in No 1

References and Remarks —

Proc A. S. B, *l c*, No 2, fig 5; 2 specimens.

"On one of them the bull is represented in the attitude of running or jumping The dots on both coins are much smaller [than in variety 1], and the letter म *m* is formed peculiarly, being hardly distinguishable from a प *p*"

Some of the coins in the Lahore Museum may belong to this variety, because in the case of No 2 (weight 53 3, diam. 75), Mr Rodgers notes that there is a "post in front" of the bull. I presume, therefore, that there is no "post" in front of the coin No 1. That is a small coin, weight 21 9, diam 65, and on obverse only *Çrī Mihira* is legible

Variety 4 —

Obv As in Variety 1

Rev. Wheel (sun) below bull's feet. No legend

References and Remarks —

P. E, Pl. xxxiv, 1, 2 (Stacy) Though Prinsep and Thomas failed to read the obverse legend correctly, there is no doubt that the coins are Mihirakula's On fig 2, the syllables *Mihira* are perfectly plain.

Cunningham had two specimens of this variety

Variety 5 —

Obv Legend, presumably *Çrī Mihirakula*, below the king's head, instead of being in front of it. Ephthalite symbol ℋ in front of face.

Rev As in Variety 1

References and Remarks —

Proc A S B., *l c*, No 3, not figured 1 specimen.

Variety 6 —

Obv. Legend षाहि मिहिरगुल *Ṣāhi Mihiragula* in front of king's face

Rev No legend.

References and Remarks —

Proc A S B, *l c*, No 8, fig 12, as corrected by Fleet in *Indian Antiquary*, Vol. XV, p 249, *note*

I append textually Dr Fleet's remarks (*l c*) on the inscribed coins. They do not fit into my detailed classification of varieties, and indicate that some other varieties, or sub-varieties, exist.

"Mihirakula's coins . come in large numbers, in copper, from the neighbourhood of Rāwalpiṇḍī and Kāçmīr .

I have had the advantage of examining those in General Cunningham's collection, and I found them to give two varieties of his name, Mihirakula, and Mihiragula, out of twenty-two of the best specimens, ten gave the termination as *gula*

What the termination *kula* or *gula* may mean, I must leave Persian scholars to decide.[1] But there can be no doubt that his name, as preserved by Hiuen Tsiang, and in the *Rājataranginī* and the inscriptions, is simply the Sanskritised form of a foreign word *mihrkul*, which in the sense of a certain kind of cotton-cloth, actually does occur in the *Āīn-i-Akbarī.*[2]

Further, on his coins, his name as *Mihirakula* is coupled with the Hindū title *Çrī*, whereas the other form, *Mihiragula* is coupled with the purely foreign name or title of *Ṣāhi* "[3]

" His coins shew clearly his religious or sectarian tendencies, both foreign and Hindū Nine of the coins examined by me with the Sanskrit legend *Çrī Mihirakula* on the obverse, have as the principal symbol on the reverse, a bull, the emblem of Çiva and the Çaiva worship, coupled in the seven cases with the legend *Jayatu vṛsa* [*h*], 'victorious be the bull'

Another leading symbol of his coins is an eight-rayed sun or planet, usually with a periphery or circle round it; this appears on the obverse of three of the same set of coins, and in two instances on the reverse, below the fore-feet of the bull

And a third leading symbol is the crescent moon, which occurs in eight instances in the same set on the reverse, over the back of the bull

Also, two coins, of the same set, and one of the set that has the Sanskritized foreign legend *Ṣāhi Mihiragula*, have on the obverse a standard, the top of which is either the eight-rayed sun, or a crescent moon, or perhaps a *triçūla*, another emblem of the Çaiva faith "[4]

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[1] Turkish scholars would be more likely to decide the question (V A S)

[2] "Blochmann's translation, Vol I, pp 95, 617"

[3] " Only the second syllable, *hi*, actually falls within the edges of the specimens examined by me But other coins of the Kaçmīr series give the complete word *Ṣāhi*, and leave no doubt that this was the title on the Mihirakula dies —The same explanation, and not that it is a coin of Hiranya, has to be applied to No 8 of the coins published by Dr Hoernle in the *Jour Beng As. Soc*, Vol LIV, Part i [*sic*, read *Proc* for 1885], p 4, [illegible]f "

[4] It has been shown above that Dr Fleet was mistaken in supposing that the prefix *Çrī* is always coupled with the *kula* form of the name, and the prefix *Çāhi* with the *gula* form *Çrī* is found associated with both forms of the name on the copper coins The Sanskrit verb *jayatu* is coupled with the name *Mihirakula* on the silver coins Probably, the variation in spelling was regarded at the time as trivial, though the *gula* form may be older than the *kula* form which produces a legitimate Sanskrit compound That compound, meaning 'the solar race,' is, of course, not suitable for a personal name The wheel, or sun, the crescent moon, and the trident, are all found on Gupta coins

Class II —Without legends.

Variety 1 :—

Obv Bust to right In front of face, the Ephthalite symbol, monogram, No 163, of the *Ariana Antiqua*, or other symbol

Rev. Running bull, with turned-up tail, to left.

References and Remarks —

Proc A. S. B, *l c*, No 6, figs. 8, 9 Fourteen specimens, one being double-struck, mostly in "very poor" condition

These coins have the "Ephthalite symbol," (mon 163 of *Ariana Antiqua*, and 373 of Rodgers' *Catalogue of Coins in Lahore Museum*), *Lahore Museum*, No 4. (*Rodgers' Catalogue*, p 141)

The monogram in front of king's face is Rodgers' No 374, a leaf-shaped symbol The average weight of 5 coins is 31·8 Diam. 7.

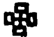
Variety 2 .—

As Variety 1, but bull to right.

References and Remarks :—

Proc A. S B, *l c*, No 7, fig 10 Dr Hoernle groups together the coins figured as 10 and 11, and says that there are 11 specimens of this variety. Figure 10 agrees with his description, but figure 11 represents a coin roughly square in shape, with a sun and the syllable तो *Tō* on obverse. It is evidently a coin of Tōramāna

Variety 3 .—

Obv. Bust of King to left In front of face, the monogram No 375 of Rodgers 

Rev Bull to right, as in Variety 2

References and Remarks —

Lahore Museum, No 5 Weight 26 1 Diam 8.

There can, I think, be very little doubt that these three varieties of anonymous coins are rightly assigned to Mihirakula, though it is of course, just possible that they were struck by some contemporaneous Hun chief, of whom we know nothing

I cannot attempt at present to pursue further the subject of the White Hun coinage, or to treat of the issues of chieftains more obscure than Tōramāna and Mihirakula. My discussion, though avowedly incomplete, will, it is hoped, introduce a certain amount of order into a subject which has hitherto, when discussed at all, been treated in a desultory and confused fashion. Any numismatist who is fortunate enough to have access to well-stocked cabinets can easily fill in the omissions and complete my rough outline During the passage of these pages through the press the reprint of Cunningham's paper, with plates, has appeared in the *Numismatic Chronicle* for 1894. I have worked into my text the necessary references to that reprint for the Indian coinages of Tōramāṇa and Mihirakula The obscure cognate issues are described and figured by Cunningham

Addendum to Part V

When looking through a mass of pamphlets, I have come across a short paper, by M E Drouin entitled *Quelques Noms de Princes Touraniens qui ont régné dans le Nord de l' Inde aux VI^e et VII^e Siècles*, which I had forgotten and overlooked.[1]

M Drouin prefers the term Turanian to any other as a general term to include the Central Asian invaders of India, and gives the reason for his preference as follows "A défaut de terme précis pour désigner l' ensemble des divers peuples tartares venus de l' Haute-Asie qui ont régné en Sogdiane, à Kaboul, et dans le Pendjâb, je me sers de l' expression de *Touranien*, qui est celle même employée par les Perses, dans leurs épopées comme dans leur histoire, pour désigner les peuples anariens, leur ennemi héréditaire Ce mot est préférable a ceux de *Scythe* ou *Tartare*, qui sont, l' un trop ancien et l' autre trop moderne"

Some of the coins referred to by M Drouin are those in the British Museum, described by Cunningham, and some are in Berlin

The king's name on the Udayāditya coins, which was read by Thomas as *Lamata*, and by Cunningham as *Lakhana*, is read by M Drouin as *Latona* or *Lanona.*

Concerning the *Tōra* coins he is cautious, and says, "Tora est peut-être une abréviation de Toramâṇa (cf Hoernle, *Proceedings J Asiatic Soc*, *Bengal*, janv 1885) Tora est un vieux mot tartare qui signifie 'prince' et qui est resté dans l'ouigour et le turc oriental (تورا) Les monnaies qui ont les noms de Tora et Mihirakula ont sur leur revers, en place du pyrée, ou le nandi ou la roue solaire"

As to the era of the Huns, M Drouin suggests that it dates from about the year A.D., 448, and refers to a paper of his on the subject in the *Journal Asiatique* for 1890

He mentions a paper on the *Gadhiâ coins of Gujarât and Mâlvâ* by the late Bhagwân Lâl Indraji, which appeared in the Journal of the Bombay Branch of the Royal Asiatic Society for 1876.

M. Drouin finally observes that the 'Turanian' princes sometimes made use of a peculiar alphabet composed both of Greek and Pahlavī letters, read from right to left. To this alphabet he gives the name Irano-Scythic

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[1] The extract which I possess is paged 546-550, and is, I believe taken from the *Journal Asiatique*, Mai-Juin, 1893

Note on the Preceding Paper —*By* Dr A F Rudolf Hoernle.

There is one point in the preceding admirable survey of the coinage of the Gupta period, on which, as it concerns myself more nearly, I wish to add a remark It is the name of the predecessor of Nara Simha Gupta on the Bhitarī seal

It has been read Pura Gupta by myself (*Journal*, A S B, for 1889, vol lviii, p 90) and by Dr Fléet (*Indian Antiquary*, for 1890, vol xix, p 226), Sthira Gupta by Professor Buhler (Smith's *Observations*, p 83, footnote 2, and *ante*, p 166, footnote), and Puru Gupta by General Sir A Cunningham (*Coins of Mediæval India*, pp 10, 13).

As to Sthira Gupta, Professor Buhler, so far as I am aware, has nowhere published that reading *himself* The footnote, *ante*, p 166, will be apt to convey the impression, that Professor Buhler arrived at his reading after an examination of the *cast* which Dr. Fuhrer says he sent him "at the time," (when ?) This would not be correct. The reading was originally based on an examination of the *collotype* of the seal published by me in the *Journal* for 1889 Immediately after the receipt of a copy of my paper and the collotype, Professor Buhler wrote to me to suggest the reading Sthira Gupta. His reasons, as explained in his letter, were 1, that Pura Gupta was an unsuitable name, 2, that the traces of the first akshara, shown in the collotype, could be read as *sthi*; 3, that Sthira was another name of Skanda, and that accordingly the reading Sthira had the advantage of eliminating a new king.

With regard to reason No 2, Professor Buhler laid special stress on the fact, that the collotype showed a slight trace of a superscript *i*. This, indeed, is the only reason of any cogency, for the other two points are mere *a priori* considerations, which, at best, may confirm a case already proved, but cannot be evidence themselves

Now that trace of a superscript *i* owes its existence solely to the character of the collotype It has no existence on the original seal There the space over the first akshara is as smooth and clear, as any one can wish The unfortunate trace on the collotype is due to a slight *indentation* on the seal, not to any *elevation* The *cast*, of which Dr Fuhrer speaks, if well-made, should show this fact, and it is for this reason, that I do not believe that Prof Buhler's opinion (if he still holds it) is based on the cast. However, casts are not altogether serviceable. I may, therefore, mention here that there exist three electrotype facsimiles, made at my request in the Survey of India Offices in Calcutta. One of them was presented by me to the British Museum in London, and the two others to the Museums in Berlin and Calcutta respectively These are in every respect as good as the original, and any one who cares may examine them to verify the reading Pura Gupta On these facsimiles, as well as on the original seal, this particular name is legible enough to the naked eye, but as the note, *ante*, p 166, appeals to the "magnifying glass," I may add that I did make use of a magnifying glass, when I first read the name, and so (I have no doubt) did Dr. Fleet

In the *Indian Antiquary* (*l c*) Dr Fleet has explained the whole case so clearly, that I can do no better than quote his words —

> "In line 6, the name of the son of Kumâragupta I is undoubtedly Puragupta, as read by Dr Hoernle The suggestion has been made to me that the text has Sthiragupta, as a variant of the name of Skandagupta, who is the known son of Kumâragupta I., mentioned in the other records that we have It is unnecessary to point out other objections to this suggestion, because Sthiragupta is most certainly not the name that we have here The mark below the consonant in the first syllable is distinctly the subscript *u*, formed as in the case of *mu* throughout, and the smooth surface of the plate here shews that nothing over and above this mark was engraved the subscript *th* was most certainly not formed. The consonant itself is a little rubbed, but it is distinctly *p* The idea of a superscript *i*, derived from the collotype, is due, partly, to the fact that the up-stroke of the *p* runs a trifle too high, and partly to an indentation in the surface of the seal, above the first part of the *p*, which, in the collotype, has appeared in such a way as to justify the supposition of a superscript *i*, the vowel, however, was not engraved On the analogy of the names of the other early Guptas, my own idea, before seeing the original seal, was that the name here might be Suragupta, "protected by the gods." It is, however, indisputably Puragupta, which must mean "protected by a city, or by cities," and is not to be taken as an abbreviation of Purârigupta, Puramdaragupta, or any such appellation"

Sir A Cunningham reads Puru Gupta. He does not explain his reasons. But though he says that the reading Pura Gupta is "quite inadmissible" (*l c*, p. 13, footnote), I note that he agrees with Dr. Fleet and myself in reading the first akshara as *pu*, which is the only point in dispute. His reading of the second akshara as *ru* is opposed to Professor Buhler, who agrees with Dr Fleet and myself in reading *ra*, and indeed, this particular akshara is on the seal as plain as it well can be

Moreover the name *Puru Gupta* is not a whit more suitable than the name Pura Gupta. But I must confess my inability to quite understand the force of this objection of unsuitability Pura Gupta does "give sense", it means (as Dr Fleet points out) "protected by a city, or by cities" And why is it necessary that it should be "the name of a deity"? (For the objections, see *Observations*, p. 83, footnote 2) That may seem to us, perhaps, to have been more symmetrical, but who is to judge those who gave or assumed the name? Any how, considerations of this kind, do not make evidence, to settle a dispute I am free to confess, that I should have preferred reading Sura Gupta or Sûra Gupta, if the case had permitted it, and if we are to have recourse now to emendations of the text as it stands, and to admit an error of the engraver, I certainly prefer Sura Gupta to Sthira Gupta, for which latter the seal offers no support

The Tribes, Clans, and Castes of Nepāl By Captain Eden Vansittart, *5th Gurkhas* [1]

[Read, February, 1894]

Population.—The population of Nepāl is estimated at about 2,000,000, which, if we calculate the area at 54,000 square miles, gives 37 per square mile This, though a low density of population, is as much as we should expect, considering the mountainous nature of the country.

I consider this estimate as to population a very low one. Nepalese authorities give the population as over 5,000,000, and the Resident, Col Wylie, considers this about the correct figure

Aboriginal inhabitants.—The great aboriginal stock of Nepāl is Turanian The fact is inscribed in characters so plain on their faces, forms, and languages, that it is unnecessary to trace their origin historically The different tribes, as they occur, in a tolerably regular series, from the Kālī river on the west to the Michi river on the east, are —

1st —Cis-Himalayan Bhoṭiyās [2] or Tibetans
2nd —Sunwar
3rd —Gurung
4th —Magar
5th —Murmī
6th —Newār
7th —Kirontī
8th —Limbū
9th —Lepchas.

The cis-Himalayan Bhoṭiyās are found pretty generally diffused throughout the whole extent of the limits of the Michi and the Kālī rivers, but are confined to the higher Alpine regions under the snows.

The Gurungs and Magars (military tribes), having participated in the Gurkhā conquest, spread east and west, in no scanty numbers, to the Michi and the Kālī. The rest of the tribes have a more restricted fatherland or *janma bhūmi*, and the *locale* of the Gurungs and Magars was similarly circumscribed before the Gurkhā conquest, for their real habitat is to the west of the great valley of Nepāl The valley of Nepāl and its whole vicinity is the region of the Murmis and Newārs The Newārs constitute the largest section of the inhabitants of the main valley, but are to be found beyond its limits They were the owners of the country prior to the Gurkhā invasion, and they still form the bulk of the population of Paṭan, Bhātgāõ, and most of the smaller towns. The inhabitants exhibit a list of princes for several thousand years back, which is given in Colonel Kirkpatrick's work, but without much evidence of its authenticity They are in general a shorter and stouter built set of men than the Gurkhās, and their features are more of a Mongolian type They perform almost all the agricultural and mechanical works of the valley, and many of them are very skilful carpenters, and workers in metal, painters, and embroiderers.

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[1] [The transcription of most of the Tribe-names in this article is that given by the author The Society has, as yet, no authorised system of transliteration for Tibeto-Burman words Ed]

[2] The name of the country known to us as Tibet is "Bhoṭ"

The Newārs are divided into two grand divisions—

1st—The Çiva-Mārgī Newārs, who are worshippers of Çiva, and Hindūs in religion

2nd—The Buddha-Mārgī Newārs, who are worshippers of Buddha Of the whole Newār population, one-third is probably purely Hindū in religion, the remaining two-thirds being Buddhists

There are in all 68 hereditary classes—

Çiva-Mārgī Newārs	..	14
Buddha-Mārgī	...	16
Heterodox Buddhists, or mixed Çiva-Mārgī or Buddha-Mārgī	...	38

The Sunwars are found west of the valley and north of the Gurungs, and the Magars near and among the Bhoṭiyās To the east of the valley, in the basin of the Sapta Kōsī, is the abode of the Kirontīs and Limbūs. These sub-Himalayan races inhabit all the central and temperate parts of these mountains, the northernmost tracts being occupied by the Bhoṭiyās, and, towards Sikhim, by Lepchas The southernmost region, as well as the low valley of the interior and central region, is inhabited by the following tribes —Kuswar, Boṭiyā, Kumhā, Bhramū, Denwar, and Darī These tribes inhabit, with impunity, the lowest and hottest valleys of Nepāl, just as the Thārūs and Boksās do the Tarāī They appear to have perfect immunity from the malaria common to the region they inhabit—an immunity unknown as an attribute of any other people whatever

Wherever malaria rages, from March to November, beyond the sāl forest and within the hills, we find Denwars, Darīs, Bhramūs, and Mānjhīs, and these only, sometimes collected in villages, but usually in scattered cottages of unhewn stone They follow the avocations of agriculture, potters, fishermen, and ferrymen These men do not all, if any, belong to the ordinary Tartar stock, but probably to the aboriginal or ordinary stock of Indian population. They are quite distinct from the dominant Tartar breeds of the mountains, and possibly emigrated from the plains countless generations back.

The Thārūs and Boksās[1] inhabit the malarious districts of the Tarāi, generally along the foot of the sandstone range. Here and there small patches of cultivation are scattered about, where the jungle has been cleared and little hamlets and villages formed. They grow a little gram, but hardly enough for their own consumption, and live from hand to mouth, eking out their subsistence by hunting and fishing. They are puny, badly developed, and miserable looking races, live almost in a state of nature, and never appear to suffer from any exposure. Though they look half-starved, they are capable of undergoing considerable fatigue. They supply the class of dāk runners, and also mahāuts, and others, who, during the hot and rainy months, are employed in catching wild elephants. They seem to combine the activity of an animal with the cunning and craftiness so characteristic of the human savage. In addition to the aboriginal tribes mentioned, we find living amidst the dense forests of the central region of Nepāl, to the westward of the great valley, three broken tribes, *viz.*, the Chepong, Kusunda, and Hayus. These are few in numbers, and live nearly in a state of nature; they have no apparent affinity with the civilised races of the country, and seem like fragments of an earlier population. They pay no taxes, acknowledge no allegiance, and live entirely on wild fruits and the produce of the chase. They hold no intercourse with the people about them, but are inoffensive; they appear to be gradually dying out, and will probably be extinct in a few generations.

The Mundās and Urāons, originally emigrants from Chutiya (Cuteyā) Nāgpur, also inhabit the Tarāi, and enjoy the same immunity from malaria as the Thārūs and Boksās.

Military Tribes.—The Military tribes of Nepāl, from which the fighting element in our army is almost exclusively drawn, are the following:—

Khas	Gurung
Magar	Ṭhākur

There are also a few Limbūs and Rais to be found in most of our Gurkhā regiments. They are residents of Eastern and North-Eastern Nepāl. A few Nagarakōtīs (Newārs) are also found in most of the regiments.

Gurkhās.—The district of Gurkhā is situated in the north-east portion of the basin of the Gandak, occupying the country between the Triçūlgaṅgâ and the Swētī Gandak.

Gurkhā.—The chief town is called Gurkhā, and is about 55 miles to the west of Kāṭhmāṇḍū This town, and eventually the district is said to have obtained its name from a very famous saint called Gōrkhānāth, or Gōrakhānāth, who resided in a cave, which still exists, in the hill on which the city of Gurkhā was built. The ancestors of the present race of Gurkhās derived their national name of Gurkhā from this district, in which they first established themselves as an independent power. The term Gurkhā is not limited to any particular class or clan; it is applied to all those whose ancestors inhabited the country of Gurkhā, and who from it, subsequently, extended their conquests far and wide over the eastern and western hills

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[1] Guides would probably be obtained from these classes.

The men of Doti, Jumlā, and other western portions of Nepāl and the Kumaon hills, are Parbatiyās (highlanders), but they are not Gurkhās, and never were so, while certain Damais and Sarkhis are recognized as "Gurkhālīs," notwithstanding their very low social standing, from the mere fact of their ancestors having resided in the Gurkhā district In 1802, Dr F Hamilton wrote —

> "The first persons of the Gurkha family, of whom I have heard, were two brothers, named Kancha[1] and Mincha, words altogether barbarous, denoting their descent from a Magar family, and not from the Pamars, as they pretend"

Khancha (Khañca) was the founder of the imperial branch of the family, *viz*, they remained Magars Mincha (Miñca) was the chief of Nayakōṭ He adopted the Hindū rules of purity, and his descendants intermarried with the best families, although not without creating disgust To these were granted the lofty rank and honour of the Kshatriya order, *viz*, they became Khas

The Khancha family possessed Bhirkōṭ, Gharhung, and Dhōr

Bhirkōṭ seems to have been the head of the whole, as its chief was at the head of a league containing Nayakōṭ.

Mincha, the Rājā of Nayakōṭ, and the chiefs of this place, although they lived pure, continued to the last to follow in war the impure representatives of Khancha. A branch of the Mincha family ruled at Kaskī The chief of Lamzung was descended from a younger son of the Kaskī ruler, and in time became very powerful, and he was followed in war not only by his kinsman, the chief of Kaskī, but by the Rājā of Tanahung

One of the Lamzung Rājās had a younger brother, Darbhā Sāhi[2] who rebelled and seized Gurkhā, which then formed the southern part of the principality The capital, Gurkhā, is situated on a very high hill, and contains the temple of Gōrakhānāth. From this we may infer that the proper name of the place is Gurakhā, and that previous to having adopted the doctrine of the Brāhmans, this family had received the "jōgīs," or priests, of Gōrakhānāth as their spiritual guides

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[1] "Kañca" is the Khus Khura for "younger brother"

[2] It should be noted that a descendant of Mincha, the converted Mangar, appears within a few generations as a Ṭhākur of the Sāhi clan in Darbha Sāhi. It is also interesting to note how Mincha, the Rājā of Nayakōṭ, and the chiefs of this place, although they lived pure, nevertheless to the last followed in war the impure representatives of Khancha, but a few generations later we see this invert-

The first chief of Gurkhā was Darbha Sāhi, and his descendants were as follows —

1 Rāma Sāhi
2 Pūrna Sāhi.
3 Chatra Sāhi
4 Dambara Sāhi
5 Vīra-bhadra Sāhi
6 Pṛthvī-pati Sāhi
7 Nṛ-bhū-pāla Sāhi

These chiefs entered into none of the leagues formed by their neighbours, but trusted entirely to their own vigour

Nṛ-bhū-pāla Sāhi procured in marriage, first, a daughter of the Palpa family, and secondly, a daughter of the chief of Malibam His eldest son, Prthvī-nārāyana Sāhi, was a person of insatiable ambition, sound judgment, great courage, and unceasing activity He was practically the great founder of the house of Gurkhā.

Khas.—The original seat of the Khas, to whom by general usage the name of the "Parbatiyā" (highlander) is given, appears to have been Gurkhā, where, as has been shewn, they had been established for seven generations before they marched, under Prthvī Nārāyana, to conquer the kingdom of the Newārs in 1768 A D.

Although Gurkhā was the original seat of the Khas, yet their king was a Thākur, and it may be added that from the earliest history of Gurkhā as a kingdom, *viz.*, from the time of Darbha Sāhi to the present year of 1892, every king has been a Thākur and of Sāhi clan, Sāhi and Sāh are the same, *vide* Brian Hodgson.

Now owing to the conversion of many Magar chieftains to Hinduism, who, although converts, were nevertheless followed by their clans, whether converted or not, and owing to the marriages of the rulers of Gurkhā for generations with the daughters of various Magar and Gurung chieftains, by the time that Prthvī Nārāyaṇa ascended the throne, the fighting element of the kingdom of Gurkhā consisted almost entirely of Magars, Gurungs, Khas, and Ṭhākurs To these tribes, therefore, the term Gurkhā should apply The original home of the Gurungs was the country about Lamzung, Ghandrung, and Sikhs The Magars were south of the Gurungs, and about Gulmi, Argha, Kachi, and Palpā.

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ed, and we find the descendants of the converts with the rank of Kshatriya proudly ruling the country, and followed in war by the descendants of Khancha and his impure representatives

The Rais and Limbūs inhabited the whole of the country to the north and to the east of the Nepāl valley The Lepchas are the inhabitants of Sikhim. About the ancient history of these tribes nothing is known. We know, however, that Nepāl never was subjected by the Delhī Emperors or by any other of the great Asiatic conquerors

Advent of Rājpūts —It is stated by Colonel Tod that the Gurkhā dynasty was founded towards the end of the 12th century by the third son of the Rājpūt Rājā Samarsī, ruler of Citōṛ,[1] who settled in Palpā

A Nepālese tradition exists, which says that the Rājā of Udaipur probably Hari Siŋgh, was besieged by the Muhammadans in his capital He made a long and gallant defence, but at last food and water began to fail him, and, foreseeing the horrors of famine, he destroyed all the women and children within the city, to the number of 70,000, set fire to the town, and with his garrison attacked and cut his way through the Muhammadan hosts, and took refuge in the hills of Nepāl to the west of the Gandak river, where he was hospitably received by the aborigines

Whatever truth there may be in the above traditions, there can be no doubt that large numbers of Rājpūts and Brāhmans did make their appearance in Western Nepāl about the twelfth century, and it can easily be understood how, in time, from their superior intelligence and civilization, they obtained positions of influence and importance amongst the barbarians who inhabited the land

In time it would appear that a number of the Magar mountaineer princes were persuaded to follow the doctrines of the Brāhmans, and many of the subjects and clans of these princes were induced to follow the example set them, but a large number also refused to be converted

To the former the Brahmans granted the sacred thread, whilst they denied it to the latter, and hence have sprung up tribes called Thapas, Ghartis, Ranas, etc, etc, some of whom wear the thread and are called Khas, whilst the others do not wear the thread and remain merely Magars

The Brāhmans, to completely reconcile their most important converts, worked out marvellous pedigrees for them, and gave them the right to claim descent from various famous origins, such as "Sūrya-vamçī," ("born of the sun"), "born of the moon," "born of a king," etc., etc.

The progeny of the women of the country by Brāhmans were, as a term of reproach called "Khas,"[2] or the "fallen," from *khasnu*, "to fall," but the Brāhmans invested this progeny with the sacred thread also, and thereby gave them a higher social standing than the Magars and Gurungs. This is most clearly and graphically described by Brian Hodgson After describing how the Muḥammadan conquest and bigotry continued to drive multitudes of Brāhmans from the plains of Hindūstān to the proximate hills, which now form the western territories of Nepāl, Brian Hodgson says—

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[1] This would account for the numerous Citōriyā clans

[2] Dr Francis Hamilton in his introduction to his book, published in 1819, says — "The country between Nepal (valley) and Kasmir, in the ancient Hindu writings, is called Khas, and its inhabitants Khasiyas I am told ....the Khasiyas are considered as abominable and impure infidels."

> "The Brahmans found the natives illiterate, and without faith, but fierce and proud. They saw that the barbarians had vacant minds, ready to receive their doctrines, but spirits not apt to stoop to degradation, and they acted accordingly To the earliest and most distinguished of their converts they communicated, in defiance of the creed they taught, the lofty rank and honours of the Kshatriya order
>
> "But the Brahmans had sensual passions to gratify, as well as ambition They found the native females—even the most distinguished—nothing loth, but still of a temper, like that of the males, prompt to resent indignities
>
> "These females would indeed welcome the polished Brahmans to their embraces, but their offspring must not be stigmatized as the infamous progeny of a Brahman and a Mlechha To this progeny also, then, the Brahmans, in still greater defiance of their creed, communicated the rank of the second order of Hinduism, and from these two roots (converts and illegitimate progeny), mainly spring the now numerous predominant and extensively ramified tribe of Khas, originally the name of a small clan of creedless barbarians, now the proud title of Kshatriya, or military order of the kingdom of Nepal The offspring of the original Khas females and of Brahmans, with the honours and rank of the second order of Hinduism, got the patronymic titles of the first order, and hence the key to the anomalous nomenclature of so many stirpes of the military tribes of Nepal is to be sought in the nomenclature of the sacred order
>
> "It may be added, remarkably illustrative of the lofty spirit of the Parbattiahs (highlanders), that, in spite of the yearly increasing sway of Hinduism in Nepal, and the various attempts of the Brahmans in high office to procure the abolition of a custom so radically opposed to the creed both parties now profess, the Khas still insist that the fruit of commerce (marriage is out of the question) between their females and males of the sacred order, shall be ranked as Kshatriyas, wear the thread and assume the patronymic title"

Now, as has been shown, from the advent of these thousands of foreigners, and their numerous progeny, sprang up a new race, called Khas, and with this new race also came a new language, a kind of Hindī patois, which was called the language of the Khas, or Khas-khura and is now-a-days the *lingua franca* of Nepāl

Dr F Hamilton, in his book published in 1819, says that the Magars who resided in the hills to the west of the Gandak river, seem to have received the Rājpūt princes with much cordiality.

They have submitted to the guidance of the Brāhmans, but formerly had priests of their own, and seem to have worshipped chiefly ghosts.

The Khas are sprung from two sources (1) from the first converts to Hinduism to whom the Brāhmans gave the rank and honours of the Kshatriya order, (2) from the offspring of Brāhman intercourse with hill-women, to whom the rank of Kshatriya was also given.

The Khas are the predominant race of Nepāl They are generally slighter, more active, and more intelligent than either the Magar or Gurung. They are Hindūs, wear the thread, and are more liable to Brāhmanical prejudices than the Magar or Gurung. They, however, make little of the ceremonial law of the Hindūs in regard to food and sexual relations Their active habits and vigorous characters could not brook the restraint of ritual law Their few prejudices are rather useful than otherwise, inasmuch as they favour sobriety and cleanliness They are temperate, hardy, and brave, and make good soldiers They intermarry in their own castes, and have a high social standing in Nepāl.

In the Nepalese army almost all the officers above the rank of Lieutenant are Khas, and so are by far the greater proportion of officers below the rank of Captain. They are intensely proud of their traditions, and look down upon Magars and Gurungs In their own country any Khas who runs away in a battle, becomes an outcast, and his very wife is unable to eat with him. They are very national in their feelings

In the Nepalese "Rifle Brigade," which consists of the picked men of all classes, are to be found numbers of Khas of 5 feet 9 inches and over, with magnificent physique

Colonel Bahādur Gambar Singh, who at present commands the "Rifles," served as a Private under Sir Jang Bahādur at Lucknow during the Mutiny He there greatly distinguished himself by single-handed capturing three guns and killing seven mutineers He received an acknowledgment from the British Government for his bravery, and the Prince of Wales presented him, in 1875, with a claymore, with an inscription thereon. In this fight Colonel Gambar Singh had no other weapon than his kukri, and he received 23 wounds, some of which were very dangerous, and to this day his face is scarred with huge sword cuts He also lost some fingers, and one of his hands was nearly cut off. Sir Jang Bahādur had a special medal struck for him, which the gallant old gentleman wears on all great parades

None of our Gurkhā regiments enlist Khas now, although in most regiments a few are to be still found, who were enlisted in olden days.

Experience would seem to prove that Magars and Gurungs are undoubtedly better men than Khas, yet a regiment of Khas would make a very fine body of soldiers, and in the present days, when men of good fighting classes are so much needed, it seems a pity that Government makes no use of this material, out of which a regiment or two could easily be raised.

Khattrīs.—About Khattrīs, Dr. L. Hamilton says :—

> "The descendants of Brahmans by women of the lower tribes, although admitted to be Khas (or impure), are called Kshattris or Khattris, which terms are considered as perfectly synonymous."

It would seem, however, that some proper Khattrīs, called "Deokōṭās," from Bareilly, did settle in the country, and intermarried with the Khas Khattrīs. All the Khattrīs wear the thread, and are considered as belonging to the military tribes.

Since the return of Jang Bahādur from England, a number of Gurkhā Khas have taken to calling themselves Chattrīs. There is no such man in the whole of Nepāl as a Gurkhā Chattrī.

Khas there are, and Khattrīs there are also, but Chattrīs there are none, and it is merely a title borrowed latterly from India.[1]

Brian Hodgson also mentions a tribe called Ekthāriyās, the descendants of more or less pure Rājpūts and other Kṣatriyas of the plains. They claimed a vague superiority to the Khas, but the great tide of events around them has now thoroughly confounded the two races in all essentials, and therefore they will not be shown as a separate tribe, but be included with Khas. Brian Hodgson says :—

> "The Khas were, long previously to the age of Pṛthvi Nārāyaṇa extensively spread over the whole of the Chaubisia, and they are now to be found in every part of the existing kingdom of Nepāl, as well as in Kumaon, which was part of Nepāl until 1816. The Khas are more devoted to the house of Gurkhā, as well as more liable to Brahmanical prejudices than the Magars or Gurungs, and on both accounts are perhaps somewhat less desirable as soldiers for our service than the latter tribes.[2] I say somewhat, because it is a mere question of degree, the Khas having certainly no religious prejudices nor probably any national partialities which would prevent their making excellent and faithful servants-in arms, and they possess pre-eminently that masculine energy of character and love of enterprise which distinguish so advantageously all the military races of Nepāl."

Matwala Khas.—To the north and to the west of Sallian numbers of Matwala Khas are to be found. They are rarely if ever found to the east of the Gandak river. There can be no doubt that this race found its origin somewhere about Sallian, or perhaps still further west.

The Matwala Khas is generally the progeny of a Khas of Western Nepal with a Magar woman of western Nepal. If the woman happens to belong to the Rana clan of the Magar tribe, the progeny is then called a Bhat Rana The Matwala Khas does not wear the thread He eats and drinks, and in every way assimilates himself with the Magars and Gurungs He invariably claims to be a Magar. Among the Matwala Khas are to be found those who call themselves Bohrā, Rōkā, Chohān, Jhankī, &c These are easy to identify, but it is more difficult to find out a Matwala who calls himself a Thapa His strong Magar appearance, his not wearing the thread, and his eating and drinking freely with the real Magars, all tend to prove him to be what he almost invariably claims to be, *viz*, a real Magar I have found men in the ranks who for years had served as, and been considered, Magars, but who really were Matwala Khas. Some very excellent recruits are obtained amongst the Matwala Khas, although the greater proportion are coarse-bred and undesirable

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[1] Khattrī and Chattrī are really the same word, both being corruptions of *Kṣatriya*. ED.

[2] This was written in 1832, namely, only sixteen years after our war with Nepāl and it is on that account that Brian Hodgson says the Khas are somewhat less desirable as soldiers for our service—not for want of bravery or soldierly qualities.

KHAS.

Adhikhari Clans

Dhami
Khadsena
Man
Musiyā
Pokrial
Thakuri
Thami
Tharnai

Baniyā Clans

Sinjapati

Basnayit Clans

Khaptari
Khulal
Puwar
Rakmi
Sripali

Bhandari Clans

Lama
Raghubangsi
Sinjapat

Bhist Clans,

Dahal
Kalikotia
Pawar

Gharti Clans

Bagalia
Kalikotia
Khanka
Khulal

Karkhi Clans.

Khulal
Lama.
Mundala
Rukmel.
Rumi
Sutar

Khanka Clans

Kalikotia
Khaptari
Khulal
Lakangi.
Lamchania.
Maharaji
Palpali
Partial
Powar.

Khattrī Clans

(Progeny mostly of Jaici or Brāhmans with Khas)

Acharja.
Adikhari.
Arjal
Barla
Bhatari
Bhusal.
Dal
Dangali.
Deokota.
Dhakal.
Dhamal
Dital.
Ghimiria
Gothami
Karkha
Katiora
Khaptari
Khulal
Kirkiseni
Koiiel
Lamchauia
Pande.
Panth
Parajuli
Pekurel.
Phania
Poryal
Remi
Rigal
Sakhtila
Sapkotia.
Silwal
Suveri.
Tandan
Tewari

Kanwar Clans

Arjal
Bagialia.
Khauka
Khulal.

Thapa Clans

Bagalia
Bagial
Deoga.
Gaghya
Ghimiria
Gudar
Kalikotia
Khaptari
Khulal
Lamchania
Maharaji
Palami
Parajuli
Puwar
Samal
Suyal
Thakurial

Other true Khas, but not classified yet

Alphaltopi
Am Gaif
Baj Gai
Palia
Bamankoti.
Batial.
Bhat Ojha
Bhat Bai
Bhurial
Bikral
Chalatani
Chanial
Chanvala Gai
Dahal.
Danjal
Deokōṭā (Khattri)
Dhongial
Dhungana
Ganjal
Gartola
Gilal
Hamfa Gai
Kadariah
Kala Khattri
Kanhal
Khatiwata.
Kilathani
Kukrial
Layal
Lamsal
Mari Bhus
Naopania
Osti.
Parijai Kawale
Parsai
Paurial
Porseni
Pungial.
Regmi (Khattri).
Rupakhetti
Satania
Sati
Satia Gai.
Seora
Sikhimial
Sijal
Tewari (Khattri).
Tumrakal

Magars and **Gurungs**.—These are by common consent recognised as the *beau ideal* of what a Gurkha soldier should be.

As these tribes have submitted to the ceremonial law of purity and to Brāhman supremacy, they have been adopted as Hindūs, but they have been denied the sacred thread, and take rank as a doubtful order below the Kṣatriya and above the Vaiçya and Sūdra grades. The offspring of a Khas male and a Magar or Gurung mother is a titular Khas, but a real Magar or Gurung; the descendants fall into the rank of the mother, retaining only the patronymic

Magars and Gurungs are excluded from political employ and high military commands, and have less community of interest and sympathy with the Government than the Khas, but they are still very loyal, and, like all Parbatiyās, very national in their feelings In the Gurung and Magar corps the officers, up to Captains, are Gurungs and Magars. The Gurungs lent themselves less early and heartily to Brahmanical influences; they have retained to a much greater extent than the Khas tribe, their national peculiarities of language, physiognomy, and, in a less degree, of habits In stature the Gurungs are generally larger and more powerful than either the Magar or Khas.

The language of the Magar differs from that of the Gurung only as remote-dialects of one great tongue, the type of which is the language of Tibet. Their physiognomies have peculiarities proper to each, but with the general Calmuk caste and character in both. The Gurungs are less generally, and more recently, redeemed from Lamaism and primitive impurity than the Magars, and are considered much below them in point of caste. Gurungs eat buffalo meat and village pig also. Magars eat neither the one nor the other, but though both Magars and Gurungs still retain their own vernacular tongues, Tartar faces and careless manners, yet from constant intercourse with, and military service under, the predominant Khas, they have acquired the Khas language, though not to the exclusion of their own, and adopted Khas habits and sentiments with, however, several reservations. Both Magars and Gurungs are Hindūs, only because it is the fashion, they have gone with the times, and consequently their Hindūism is not very strict [1]

The Magars and Gurungs have already been referred to as being of the Tartar race, they, in Nepāl, follow agricultural pursuits, they are square-built, sturdy men, with fine, muscular, and large chest and limb development, low in stature, and with little or no hair on face or body, and with fair complexions. They are a merry-hearted race, eat animal food, and in Nepāl drink a kind of beer made from rice, called *janr* and a kind of spirit called *raksi*. In our battalions they will drink any English wine, spirits or beer. They are intensely fond of soldiering. They are very hardy and extremely simple-minded. They are kind-hearted and generous, and, as recruits, absolutely truthful They are very proud and sensitive, and they deeply feel abuse or undeserved censure. They are very obstinate, very independent, very vain, and in their plain clothes inclined to be dirty. They are intensely loyal to each other and their officers in time of trouble or danger "

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[1] After the Nepāl War of 1816, Sir D Ochterlony expressed an opinion, confidentially to Lord Hastings, that "the Company's sepoys, then Hindūstānīs, could never be brought to resist the shock of these energetic mountaineers on their own grounds"

Near the Magars was settled a numerous tribe named Gurungs, whose manners are in most respects nearly the same with those of the Magars. This tribe was very much addicted to arms

It would appear that a Gurung chief, who was Rājā of Kaskī, settled in Ghandrung, where the Gurungs were most predominant. These people were strongly attached to his descendants, by whom they were not disturbed in their religious opinions or customs, and in their own homes they practically still continue to follow the doctrines of Sakya as explained to them by Lamas of their own tribe

No Gurungs have as yet been admitted to the dignity of Khas, but with their constant intercourse with the Khas, who are Hindūs, their original faith is getting weaker, and in time will disappear

It may here be pointed out that none of the high-sounding titles which are to be found amongst the Magars, and which were evidently brought in by the Bráhmans from Hindustan, are to be found among the Gurungs.

Amongst the thousands of Gurkhās I have seen, I have never met a Surajbansī Gurung, and doubt the existence of any [1]

The Gurung tribe consists of two great divisions—

1. The Ghārjāt (Cārjāt).
2 The Sōlahjāt

The Chārjāt, as its name implies, is composed of four castes, *viz* —

1 Ghallea
2 Ghotani (sometimes Ghundani)
3 Lama
4 Lamchania

Each of these four castes comprises a number of clans, and some of these are again sub-divided into families The Chārjāt Gurung might be called the Gurung nobility.

Every Gurung recruit knows perfectly well whether he belongs to the Chārjāt or to the Sōlahjāt, but numbers of the latter will try to claim the former A little trouble will almost invariably bring out the truth.

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[1] The Gerlen, Rilten, and Samri clans are the best of the Ghalleas The Samundar, Kialdung, and Khagi clans I have also met I have never met a single case of a Sinjali or Surjabansī Gurung of any kind Nor do I believe in their existence after careful enquiry Sinjali and Surjabansī are continually met amongst Magars, but never amongst Gurungs.

The Chārjāt Gurung is very much looked up to by the Sōlahjāt

A Sōlahjāt Gurung cannot marry a Chārjāt, nor can he ever, by any means become a Chārjāt.

Questioning a Chārjāt Gurung would be much as follows :—

"What is your name?"	"Jasbīr Gurung"
"What Gurung are you?"	"Chārjāt."
"Which of the Chārjāt?"	"Lamchania"
"Which Lamchania clan?"	"Plohnian"
"What Plohnian?"	"Atbai,"

Of the Chārjāt Gurungs the Ghallea is by far the most difficult to obtain The Plohnian and Chenwāri clans of the Lamchania are both subdivided into families, the best Plohnian family is the Atbai, and the best of the Chenwari is the Chargharī It will be noticed that nearly all Ghotani clans end with "ion"

Some excellent recruits are also obtained from the Sōlahjāt

In older days the Ghalleas ruled the country about Lamzung and had their own king, a Ghallea according to Gurung traditions. Their kingdom nominally exists to this day

The following tradition regarding the birth of Chārjāt exists —

A Thākur king asked the king of Lamzung for his daughter's hand in marriage The Ghallea king accepted the proposal favourably, and sent a young and beautiful maiden as his daughter to the Thākur king, who duly married her, and by her begot several children Some years afterwards it transpired that his young maiden was no king's daughter, but merely one of her slave attendants, whereupon the Thākur king was very angry, and sent a message threatening war, unless the Ghallea king sent him his real daughter The king of Lamzung thereupon complied, and this time sent his real daughter, whom the Thākur king married, and by whom he begot three sons (From these three sons are descended the Ghotani, Lama, and Lamchania clans) It was then ruled that these three sons and their descendants should rank equal to the Ghallea clan, and that they should be called the Chārjāt Gurungs, whilst the descendants of the children of the slavemother should be called Sōlahjāts, and should for ever be servants to the Chārjāt From this it would appear that the Ghallea Gurung is the oldest and the purest of all Gurung clans. They certainly are splendid men of the purest Gurkha type.

The Gurungs have for centuries kept up their history, which is called in Khaskura "Gurung kō Baŋgsāolī."

When the famous case of Colonel Lachman Gurung took place, Sir Jang Bahādur, being anxious to elucidate, if possible, the difference between Chārjāt and Sōlahjāt Gurungs, had the history of the Gurungs brought to him, and having read the same, declared that the Sōlahjāt Gurung must remain satisfied with his present position, and be for ever the servant of the Chārjāt The Sōlahjāt Gurung will always make obeisance to the Chārjāt, and, when travelling in their own country, the Sōlahjāt will generally carry the Chārjāt's load

It is said that Colonel Lachman Gurung offered his daughter's weight in gold to any Chārjāt who would marry her A poor man of the Ghotani clan, being sorely tempted by the bribe, offered himself as a husband but was at once out-casted and reduced to a Sōlahjāt, and so the marriage never came off

Many centuries ago, it is said, a landslip occurred which buried a whole village, and destroyed all the inhabitants, except one small boy, who was found by a Lamchania Gurung, amongt the débris He took the boy home and adopted him, but as he did not know who the father of the boy was, a difficulty arose in time as to what clan this boy should belong to

The Lamas, on being consulted, ruled that the child and all his descendants should be called Tutiā Lamchanias (*Tutiā* means broken, rugged), because he had been found on broken, rugged ground

A boy that had been deserted was found by a Lamchania Gurung amongst some reeds It was settled that this boy and all his descendants should be called Plohnian Lamchanias (*Plohn* means reeds), because he had been found among reeds

There are two regiments of Gurungs in the Nepalese army—the Kālī Bahādur and the Kālī Parsād The former is absolutely a Gurung regiment, and most of the men are Chārjāt Gurungs They are a magnificent body of men, consisting of all the picked Gurungs of Nepāl They must average over 5 feet 6 inches in height, with splendid physique

GURUNG CHĀRJĀT

Ghallea Clans

Gerlen
Gyapsing
Kialdung
Khagi

Pyling
Rajvansi or Rajbangsi
Rilten
Samri

Samnuder
Singjali
Surjabansi or Surja vansi

Ghotani Clans

Adunron
Chomron
Gholron
Harpu
Kaliron

Kamjai
Kelonron
Kilat
Kongron
Kudlron

Logon
Lamkunia
Mazuron,
Migiron
Mlogron.

Morlon.
Nagiron.
Naikron.
Pachron
Pochkiron.
Rijoron
Singoron.
Tagren or Tagron
Tari.
Thakuron.
Tenron or Tengron
Walron.

Lama Clans.

Chelen
Chenwari
Fache
Karki
Kelung
Khimu.
Kib
Kurungi.
Megi
Muktan
Nakchia.
Pachren.
Pengi
Pipro.
Pungi
Tengi.
Tidun or Titun.
Timji
Tonder
Urdung.
Yoj

Lamchama Clans

Adi.
Chen
Chenwari.
Chingi
Chomron
Kaliron.
Kroko
Kurbu.
Lem
Lengra
Lunam
Narenu.
Nasa
Naikron
Nasuron.
Pachen
Pajji Lem
Pangi
Plitti
Plohnian
Purani
Silangi
Sinjoron
Toson
Tutia or Twidian
Tasuron

GURUNGS OF THE SŌLAHJĀT.

Allea.
Bhaju
Bhuj or Bhujia
Chagli or Chakli.
Chime
Chohomonu
Choru
Chumaru.
Darlami
Dial
Dingial
Durial
Ghabbu
Ghorenj
Gnor
Gulangia
Ghabring { Ko
Sil
Siuri
Tu }
Hinj
Hurdun
Jhimal
Jimiel
Jumreli
Kepchen
Khaptari
Khatrain
Khulal.
Kinju.
Kiapchain
Kokia
Kongi Lama.
Kubchen.
Kumai
Kromjai
Lahor
Leghen
Lenghi
Lohon
Lyung
Main.
Mapchain.
Masrangi
Mobjai or Mahbrijai
Mor or Mormain
Murum
Nanra
Nansing
Pajju or Pachuu.
Palma.
Phiwali, Piwali, Phiuyali.
Plen
Ploplo
Pomai
Ponju
Pudusa
Pulami.
Rilah.
Rimal
Sarbuja.
Tahin.

Tamain
Tame.
Telej
Tendur
Tenlaja.
Thar
Tingi Lama.
Tol
Tolangi.
Torjain.
Tuti.
Uze

Several Gurungs clans, both of the Chārjāt and Sōlahjāt, are called by a certain name in Khaskhura, and by a different one in Gurung Khura —

Dingial is Khaskhura—Kepchen is Gurung Khura.
Darlami „ Plen „
Chenwari „ Pacharon „
Pajji Lem „ Kroko—Lem „

Allea is Khaskhura for a clan, whose Gurung Khura name they have forgotten.

Several clans are no doubt repeated twice, once in Khaskhura and once in Gurung Khura, but for facility of reference it is considered best to leave them thus alphabetically arranged.

Magars.—The Magars are divided into six distinct tribes, and no more, although the following all claim to be Magars and try in every way to establish themselves as such —

Bhora	(really a Matwala Khas of Western Nepal)
Roka	(„ „ „)
Chohan	(„ „ „)
Jhankri	(„ „ „).
Konwar	(progeny of mendicant).
Uchia	(„ „ Ṭhākur)

In days of old a certain number of Magars were driven out of their own country, and settled in Western Nepal among strangers From the progeny of those sprang up many clans of mixed breeds, who now claim to be pure-bred Magars, but are not recognised as such

In addition to the few mentioned above, are some others who also claim to be Magars, such as Rāwats, Dishwās, etc , but as they have no real relationship to Magars, it is considered unnecessary to enter a list of them here

The real and only Magars are divided into the following six tribes which are here entered alphabetically .—

1 Allea
2 Burathoki
3 Gharti.
4 Pun
5 Rana
6 Thapa

Brian Hodgson divides the Magars into three tribes only, *viz.*, Rana, Thapa, and Allea

So many tribes now-a-days claim to be Magars that to definitely settle which are, and which are not, entitled to the name, becomes a matter of great difficulty.

These tribes all intermarry with each other, have the same customs and habits, and are in every way equal as regards social standing, with perhaps a slight preference in favour of the Rana.

The original home of the Magars was to the west of the Gaṇḍak river (Kālī-war), and, roughly speaking, consisted of that portion of Nepal which lies between and round about Gulmi, Argha, Khachi, and Palpa

This bit of country was divided into twelve districts (Bārah Mangranth [1]), and the residents of the same in time came to be spoken of as the Magars of the Bārah Mangranth

Brian Hodgson and Captain T Smith both give the following as the Bārah Mangranth —Satung, Pyung, Bhirkot, Dhor, Garhung, Rising, Ghiring, Gulmi, Argha, Khachi, Musikot, and Isma.

By the term "Bārah Mangranth Magars" no particular set of tribes was meant The term had a purely local meaning, and referred to all such Magars, of whatever tribe they might be, whose ancestors had resided for generations within the Bārah Mangranth.

Each of these twelve districts had its own ruler, but it would appear that the most powerful kings were those of Gulmi, Argha, Khachi, and that the remaining princes were more or less tributary to these three

Since the rise of the house of Gurkhā, towards the close of the eighteenth century, the country has been re-divided, and the twelve districts no longer exist as such, and the term "Bārah Mangranth Magar" has no signification now, and is therefore falling into disuse Not one recruit out of five hundred knows what the term means

As mentioned before, the original home of the Magars was to the west of the Gandak river, but it would seem that some clans had for ages occupied certain portions of Nepāl on the east bank

The city of Gurkhā was originally the residence of the Chitoria (Citōriā) Rānās It is supposed the city was built by them, and to this day numbers of Chitoria Rānās are found there

The Magars having participated in the military conquests of the house of Gurkhā, spread themselves far and wide all over Nepāl, and numbers are now to be found to the east of the Gaṇḍak river

Allea—The Alleas in appearance seem a very pure-bred race. As a rule, they are very fair, well-made men The Allea tribe must, however, be rather a small one, as the percentage of Alleas enlisted yearly is very small They are most desirable men to get

Burathoki—Burathokis are also apparently very limited in number Some excellent specimens of Gurkhās are, however, every year obtained from this tribe They are very desirable men to get.

Gharti—The Ghartis are pretty numerous, but care should be taken in enlisting from this tribe, as they seem to be far more mixed than any of the other five pure Magar tribes. By careful selection, however, excellent Ghartis can be obtained The Bhujial Gharti lives in the valleys and high mountains to the north of Gulmi, above the Puns, but immediately below the Karantis. Their tract of country runs along both sides of the Bhuji Khola (river), from which they probably derive their name.

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[1] The Sardā on the west and the Gaṇḍak in the centre of Nepāl are both spoken of as the Kālī

The Bhujial Gharti is generally a shepherd. He lives principally on the milk of sheep, and is almost invariably a man of very good physique and heavy limbs He is remarkably dirty when first enlisted.

Amongst the Gharti clans are two that should not be confounded, although from their similarity in pronunciation one is very apt to do so The Pahare or Paharia is a good Magar. Pare or Paria (from *par*, outside) should never be enlisted He is, as his name indicates, an out-caste, or a descendant of out-castes.

Pun—The Pun tribe seems a small one, as but a small percentage of them is obtained annually. They are generally men of heavy limbs and excellent physique They much resemble Gurungs They live about Gulmi principally, although, of course, they are found in other places also They are most desirable men

Rana.—Of all Magars there is no better man than a Rana of good clan. In former days any Thapa who had lost three generations of ancestors in battle became a Rana, but with the prefix of his Thapa clan. Thus a Reshmi Thapa would become a Reshmi Rana.

An instance of this is to be found in the 5th Gurkhās, where a havildar, Lachman Thapa, and a naick, Shamsher Rana, are descended from two Thapa brothers, but three generations of descendants from one of these brothers having been killed in battle, Shamsher Rana's ancestors assumed the title of Rana, Lachman Thapa's ancestors not having been killed in battle for three generations, he remains a Thapa.

From this custom many Rana clans are said to have sprung up, and this would lead one to believe that the Rana tribe was looked up to amongst Magars. The original Rana clans were few, amongst them being the following—Chitoria, Maski, Ruchal, Hunchun, Thara, Laye, Tharali, Surjabansī or Surajvansī, Hiski, and Masraugi.

Thapa—The Thapa tribe is by far the greatest of all, and amongst them, yearly, hundreds of excellent recruits are obtained Care should, however, be exercised in the selection of Thapas, as a very large number of men adopt the title of Thapa, although they have no right to the same.

The Saru, Gaha, Bagalia and Darlami clans of the Thapa are each sub-divided into families, and the Kala family is the best in the first two.

The Purānā Gōrakh regiment in Nepāl consists entirely of Magars, and is a splendid body of men. All the finest Magars of Nepāl, excepting those in the rifle regiments, are put into this regiment. They must be nearly, if not quite, as big as the "Kālī Bahādur."

The Siris clans of the Ranas and Thapas are the descendants of children who were brought up from babyhood on the milk of goats, their mothers having died in childbirth. No Rana or Thapa of the Siris clans will eat goat's flesh.

MAGAR

Allea Clans

Arghuli or Arghounle.
Biri.
Changi
Charmi
Chidi
Dhoreli
Dukchaki or Durchaki.
Dura
Gar
Gonda
Gyangmi
Hunchun
Kalami
Khali
Khaptari.
Kharri
Khichman
Khulai
Kilung
Khulangi
Kiapchaki.
Lahakpa
Lamchania
Lamjal
Limial
Lungchia
Magiam
Maski
Meng
Pachain.
Pulami
Pangmi
Panthi
Pungi
Phiwali Piwali or Phiuyali
Rakhal
Ramial
Ro
Sarangi
Sarbat
Sarthung
Silthung
Sinjapati
Sithung
Sirpali
Surjavansi or Surjabansi
Suyal
Tarokche or Torokchaki
Thakchaki
Yangmi

Burathoki Clans.

Palkoti
Parkwanri
Darlami
Deobal
Gamal
Karmani
Lamchania
Pahare
Ramjali
Ramkhani
Ranju
Sialbang
Sinjapati.
Ulangia

Gharti Clans

Arghuli or Arghounli.
Baima
Bainjali.
Bhujial.
Bulami
Chanchal or Chantial
Lamchania.
Masrangi
Nishal
Pahare or Paharia.
Fare or Paria
Paza or Paiza
Phukan
Purja
Ramjali
Rangu.
Dagami.
Darlami
Galami
Gamal.
Garbuja
Gial
Rawal
Rijal
Rankhami
Salami
Samia.
Saru
Sawangi
Senia.

Sinjali.
Sinjapati.
Hunjali
Kagja
Kahucha
Kalikotia
Kengia
Konsa.
Sirasik.
Sunari.
Sutpahare
Talaji.
Them.
Theri.
Tirgia.
Ulangia.
Walia.

Pun Clans.

Paijali.
Balami
Bapal
Barangi
Dagami.
Darlami.
Dagain.
Dud
Hunjali
Jagonlia
Kami
Naya.
Pahare
Pajansi
Phungali.
Poingia
Rakaskoti
Ramjali.
Ramkam
Rangu
Ratuwa.
Sahi
Samia
Sarbuja
Sinjali
Sinjapata
Sutpahare.
Tajali.
Takalia.
Tamia
Thani.
Tendi
Tirkhia
Ulangia

Rana Clans.

Allea
Archami
Arghuli or Arghonle
Aslami
Bangling
Baral or Balal
Barkwanri
Parathoki.
Bhusal
Byangnasi.
Charmi
Chitoriah.
Chumi
Darlami
Dud or Dut.
Durungcheng.
Gacha
Gagha
Gaha
Gandharma.
Garancha.
Galang
Gomul
Gyandris
Gyangmi
Hiski
Hunchun
Jargha.
Jhiari
Jiandi
Kamchaki.
Kanoje
Kanka
Kiapchaki
Khiuyali.
Lamchania
Lungeli
Laye
Makim.
Maski
Masrangi.
Merassi
Namjali.
Pachain.
Pachrai
Palli
Pauti
Parta.
Phiwali-Piwali or Phiuyali.
Pulami
Pusal or Bhusal.
Rangu.
Reshmi.
Ruchal
Sarangi.
Saru
Sartungi.
Sinjali.
Siris
Suiel
Sunari
Surjavansi or Sujra bansi
Thara or Thada
Uchai
Yahayo.

Thapa Clans.

Allea.
Arghuli.
Aslami.
Bachia or Bachio.
Bagalia
  Atghari
  Darlami.
  Palungi.
  Satighari.
Baigalia.
Bailick.
Bakabal
Balal or Baral.

- Balami
- Bankabaral.
- Baola.
- Baraghari
- Bareya
- Barkwanri
- Begnashi
- Bhomrel
- Biangmi
- Birkhatta
- Bopal
- Burathoki
- Chahari
- Chantial
- Charti
- Chohan
- Chidi
- Chitoriah.
- Chumi
- Dala or Dalia
- Damarpal
- Darlami
    - Bagalia
    - Kala
    - Palungi
- Denga or Dhenga
- Dengabuja
- Dengal
- Dhanpali
- Dishwa or Disuwa
- Durel
- Fal or Phal
- Gagha
- Rokim
- Ruchal.
- Sami
- Salami
- Sanmani
- Sarangi
- Sarbuja
- Sartungi
    - Gora
    - Japarbuk
    - Jhenri
    - Kala
    - Malengia
    - Paneti.
    - Badcha
    - Barda
    - Chidi
- Gaha
    - Gora.
    - Kala
    - Kan
    - Malangi
- Gariab
- Ganchake
- Garja
- Garanja
- Gejal
- Gelung
- Giangmi
- Gidiel or Gindil
- Giangdi or Giami
- Gianris
- Gurmachang
- Gyal
- Hiski
- Hitan
- Hunchun
- Ismala
- Jargah
- Jehare or Jhiadi
- Jhankri or Jhangdi
- Jhenri
- Kaikala
- Kamcha
- Kamu
- Kangmu
- Kanlu or Kanluk.
- Kanojia
- Kanrdlu
- Kasu
- Kejung
- Keli
- Khanga
- Khaplari.
- Konwar.
- Koral
- Kulal
- Lamchania
- Lamtari
- Satighari
- Sinjali
- Sinjapati
- Sirnia
- Siris
- Somare
- Sonwanri.
- Sothi
- Suhnakhari
- Sumai or Some
- Sunial
- Sunari
- Surajvansi or Surjabansi
- Lanchia
- Langakoti
- Langkang
- Laye
- Lingjing
- Lungeli
- Makim
- Mamring
- Mandir
- Marpa
- Masrangi
- Maruncha.
- Maski.
- Medun
- Mobchan.
- Mogmi
- Namjali
- Niar
- Nidun
- Nimial
- Pachbaya.
- Pajangi
- Palli
- Pata
- Pengmi
- Phal
- Phunjali
- Phiwali-Piwali or Phiuyali
- Pitakoti
- Powan
- Puanri
- Pulami
- Rajvansi or Rajbansi.
- Rai
- Rakaskoti
- Ramjali
- Ramkhani.
- Rehari.
- Reshmi
- Regami.
- Rijai
- Rilami

Roka
Susaling
Surpāk.
Swial.
Tarbung
Thagnami
Thamu
Thara or Thad
Tharun
Tharain.
Uchai
Untaki or Wantaki
Yangdi

Ṭhākurs.—Of all Gurkhās, excepting the Brāhmaṇ, the Thākur has the highest social standing, and of all Thākurs the Sāhi is the best The Mahārājadhirāj (king of Nepāl) is a Sāhi. The Thākur claims royal descent, and even to this day a really pure-bred Sāhi Thākur is not charged rent for land in Nepāl

Ṭhākurs, on account of their high social standing, intelligence, cleanliness, and soldierly qualities, should invariably be taken if belonging to good clans As soldiers they are excellent, and they can be obtained in small numbers, with quite as good physique and appearance as the best Magar or Gurung

A Thākur who has not adopted the thread, which until marriage is with him an entirely voluntary action, has no more prejudices than the ordinary Magar or Gurung, and even after adopting the thread his caste prejudices are not so very great, nor does he ever allow them to obtrude

The Hamal Thākur should not be enlisted by any regiment

The best Ṭhākur clans are the following —Sāhi, Malla, Siṇgh, Sēn Khān, and Sumal.

The "Singala Uchai" is really a Sāhi by descent, and is excellent, but all other Uchais and the balance of Thākur clans are not up to those above mentioned, although all Thākur clans claim to be equal, with the exception of the Hamal The Hamal is not Thākur at all, but the progeny of an Opadhiā Brahman with a Thākur woman

A Thākur king, it is said, in the course of his conquests came to a very high hill called Singala This he captured from his enemies, and on the top of the same he established a garrison of Sāhi Thākurs These in time came to be spoken of as the "Uchai (Ucāī) Thākurs," from the fact of their living at a high elevation The clan Uchai will be found amongst many tribes, and is supposed to be derived from a similar reason

With the exception of the Singala Uchai, all other Thākur Uchais are the progeny of a Thākur with a Magar.

ṬHAKUR

Bam
Bansi
Chand
Chohan (doubtful).
Hamal
Jin
Jiva
Khan
Malla or Mal,
Man
Raika.
Rakhsia
Ruchal
Sahi or Sah.
Sen
Sing
Sumal
Uchai,

The Sāhi clan is sub-divided into the following :—

Sāhi or Sah.

Surjabangsi
Bhirkōṭi [1]
Galkōṭi [1]
Kallian.
Nawakōṭi

Newārs.—The Newārs are not a warlike or military race, but there can be no doubt that they occasionally produce good soldiers

The best Newār caste is the Sirisht, and one, Subadar Kishnbīr Nagarkōṭi, of the 5th Gurkhās, belonging to this caste, won the Order of Merit three times for gallantry displayed during the Kabul War, and was given a gold clasp when recommended a fourth time for conspicuous gallantry displayed at the time of Major Battye's death, in the Black Mountains, in 1888 The Newārs also fought most bravely and in a most determined way against the Gurkhā conquerors—a fact proved by their twice defeating Pṛthvī Nārāyāṇa, as before mentioned

They have letters and literature, and are well skilled in the useful and fine arts, having followed the Chinese and also Indian models, their agriculture is unrivalled in Nepāl, and their towns, temples and images of the gods are beautiful, and unsurpassed in material and workmanship.

The Jaicis are their priesthood, and should never, on any account, be enlisted in our regiments.

Rais and **Limbūs.**—Roughly speaking the Limbūs inhabit the eastern portion of Nepāl, and the Rais the country between the Limbūs and the valley of Nepāl They are mostly cultivators or shepherds.

Their physique is good, and in appearance they are much like an ordinary Magar or Gurung They are very brave men, but of headstrong and quarrelsome natures, and, taken all round, are not considered as good soldiers as the Magar or Gurung.

There is one regiment of Limbūs in the Nepalese army, called the "Bhairōnāth," but on account of their quarrelsome nature they were always quartered apart The Limbūs are born shikaris, and most of the Mahārāja's tiger-trackers are Limbūs

RAIS.

Kiranti Rais.

Bantawar
Butepa
Debu
Dilipa
Dobali.
Hatwali.
Hondui
Kaling.
Kamtal
Khambu
Kulapacha
Kulungia.
Matwali.
Potrin.
Puwal
Tanglua
Thulung
Waling.

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[1] Derived from name of cities in which they resided.

Line-boys.—The progeny of Gurkhā soldiers, who are born and brought up in the regiment, are called line-boys, and these might be divided into two distinct classes—

(1) The progeny of purely Gurkhā parents
(2) The progeny of a Gurkhā soldier with a hill-woman.

From the first class, if carefully selected, some excellent soldiers can be obtained

The second class should be avoided. The pure-bred line-boy is just as intelligent as the half-bred, and if boys are required for the band, or men as clerks, etc, it would be better to select them from out of the first class Only a small percentage of line-boys, even of the first class, should be enlisted

The claims of line-boys to be provided for in the service are undoubtedly very great, as Government has always, and very wisely, too, encouraged Gurkhā colonies, and their fathers and grandfathers, having in many cases been all their lives in British employ, they have no other home than their regimental lines

In their first generation their physique does not deteriorate much, and they almost invariably grow up to be extremely intelligent men and full of military ardour. Their military education begins with their perceptive powers, as they commence playing at soldiers as soon as they can toddle about The worst point against line-boys is that unfortunately they often prove to be men of very loose habits

Sir Charles Reid, K.C B., mentions that out of seven men who obtained the Order of Merit for the battle of Aliwal and Sobraon, five were line boys, and out of twenty-five Order of Merit men for the siege of Delhi, twelve were line-boys

Kamara.—The Kamara is a slave. Most of the higher officials in Nepal retain Kamaras as attendants The offspring of a Magar, Gurung, or Khas with a Kamara would be a Kamara

Khawās.—Khawās is the offspring of a slave-mother with a Thākur The children of this union become Khawās, and their posterity retains the name Khawās is also the name given to the illegitimate children of the king or royal family.

Konwar.—A Konwar who claims to be a Magar is the offspring of the connexion between a mendicant and any women He is generally an ill-bred-looking man, and should not be enlisted The Khas Konwar is all right.

Dhotiās.—The Dhotiās live in the extreme west in Nepāl, and south of Jumla. They are not Gurkhās at all, and should never be enlisted

Bandā.—Any man can become a Bandā, which practically means a bondsman. For instance, *A* will go to *B* and say—"Give me sixty rupees cash and I will be your bandā for two years" On receipt of money he becomes a *bandā*, and is bound to work for the two years for nothing beyond his food, but at the expiration of his two years, if he has contracted no fresh debt, he becomes free again.

Menial Classes.—The following is a list of some of the menial classes of Nepāl. No man belonging to any of these should be enlisted as a soldier.

If it is found necessary to enlist any of them on account of their professional acquirements, they should be given separate quarters, and, as far as possible, be kept entirely away from all military duties.—

Chamakhala	Scavenger
Damai	Tailor, musician
Drai	Seller of pottery.
Gain	Bard.
Kamaia	Slave
Kami or Lohār	Ironsmith
Kasai (Newār)	Butcher
Kumhal	Potter
Manji	Boatman
Pipa	Khalasi
Pore	Sweeper
Sarkhi	Workor in leather.

Sarkhi Clans.

Workers in leather—a menial class.

Basiel
Bhomrel
Bilekoti
Chitoria
Dankoti
Gaire
Hamalia.
Hitung
Madkoti
Mangranti[1]
Ramtel
Rimal
Sirketi
Sirmal.

Kami or Lohār Clans

Ghotami.
Ghartibewanri
Rashāli
Kanal

Religion, Arms, Dress and Characteristics.—About 600 years before Christ it is said that Çākya Simha (Buddha—the wise one) visited the Nepāl valley, and found that the fundamental principles of his religion had already been introduced amongst the Newārs by Manjasri from China To Manjasri by the Buddhists, and to Vişnu by the Hindūs, are assigned, respectively, the honour of having by a miracle converted the large mountain lake of Naga Vasa into the present fertile Nepal valley, by cutting with one blow of a sword the pass by which the Bāgmati river leaves the valley of Nepāl. To this day this pass is called "Kot bar," "sword-cut."

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[1] This clan is derived from the fact of the ancestors of the same having resided within Bārah Mangranth

It is known as a fact that 300 years before Christ Buddhism flourished in Nepāl, and it is still nominally the faith of the majority of Newārs (some Newārs have been Hindūs from time immemorial), yet it is steadily being supplanted by Hinduism, and before another century it will have entirely disappeared.

The Khas are Hindūs The Magars and Gurungs are so also nominally, but their Hinduism is not very strict.

The Gurungs in their own country are really Buddhists, though they would not admit it in India To this day their priests in their own homes are Lamas and Giabrings, but when serving in our regiments they submit to the Brāhmans and employ them for all priestly functions.

The fashionable religion is Hinduism, and it may therefore be said that Gurkhās are Hindūs, and with them, therefore, Brāhmans are the highest caste, from whose hands no impurity can come. The Brāhmans wear the thread (*janeo*)

Connection of higher with lower castes.—In the case of Brāhman with Khas, or Khas with lower grades, there can be no marriage Neither can a Magar marry a Gurung, or *vice versâ*, nor can a Sōlahjāt Gurung marry into the Chārjāt, or *vice versâ*

The offspring of an Opadhiā Brāhman with a Brāhman's widow is called "Jaici." That of a Jaici and certain Brāhmans with a Khas, is called Khattrī The Khattrī wears the thread, but is below the Khas

The offspring of a Khas with a Magarin or Gurungin is a titular Khas, but his very father will not eat with him, nor any pure Khas

The progeny of an Opadhiā Brāhman with a Thākur woman, or a Thākur with a Brāhman woman of Opadhiā class, gives a Hamal.

That of a Thākur with a Magarin gives an Uchai Thākur.

Religious rites.—On the occasion of the birth of a child a rejoicing takes place for 11 days, and no one except near relatives can eat or drink with the father for 10 days On the eleventh day the Brāhman comes, performs certain ceremonies, after which the father is supposed to be clean, and all friends are feasted and alms are given The same ceremony exactly takes place for a daughter as for a son, but the birth of the latter is hailed with joy, as he has to perform the "Kiriyā," or funeral rites, of the parents The girl is looked upon more or less as an expense

In our regiments 11 days' leave is always granted to a man when a child is born to him

The Brāhman (Opadhiā) selects a name for the child on the eleventh day. Boys up to the age of six months, and girls up to five months, are allowed to suck their mother's breast only

On arriving at that age a grand dinner is given, and the Brāhmans are feasted and propitiated Every friend and relation that has been invited is supposed to feed the child with grain, but this is merely a form, each man just putting a grain in the child's mouth. The ceremony is called "Bhāt khilānā," "to feed with rice

Betrothals.—All the friends and relations are also supposed to give the child presents, which generally take the shape of bangles of silver or gold Betrothals (called Mangnī) take place at any age over five years.

When a marriage is agreed upon, the parents of the boy give a gold ring to the girl as a sign of betrothal This is called "Sahi Mundrī"

Five or six friends of the parents of the boy, and these must belong to the same clan as the boy, and five or six friends of the parents of the girl, and these must belong to the same clan as the girl's father, assemble to witness the agreement in the presence of a Brāhman. A dinner is then given to the friends and relations of the contracting parties by the father of the girl, but the father of the boy is supposed to take with him some *dahī* (sour milk) and plantains as his share towards the dinner

After a betrothal, except by breaking off the engagement, which can be done by going through a certain ceremony before witnesses, but which is considered very bad form, neither party can marry any one else, except on the death of one of them, when, if the real marriage has not taken place, or been consummated, they can do so

Marriages—Marriages can take place at any time after the age of 7 It is considered good to get a girl married before she reaches the age of 13 A widow cannot marry a second time, but it is not considered disgraceful for her to form part of another man's household A widower can marry again

If a boy, without being engaged to her, meets a girl, falls in love, runs away and marries her, he and his bride cannot approach the girl's father until called by him When the father-in-law relents, he will send word telling the boy that he may present himself with his wife at his home on a certain hour of a certain day. On their arrival the father-in-law will paint a spot on their foreheads with a mixture of rice and *dahī* (*ṭīkā dinnu* or *garnu*) and then the boy and girl will have to make submission by bending down and saluting him This is called "*Dhōk Dinnu.*"

Amongst Magars it is customary for marriages to be performed by Brāhmans, and the ceremony is conducted in much the same way as the ordinary Hindū marriage There is the marriage ceremony, *Jantī*, which is so timed as to reach the bride's house after midday, and which is first greeted with a shower of rice-balls, and then feasted by the parents of the bride The actual marriage takes place at night, when the ceremony of *Phērā* (circum-ambulation round the sacred fire) is performed and afterwards the *Añcal Gathā* (knotting a cloth which is stretched from the bridegroom's waist over the bride's shoulder). The latter ceremony is said to constitute the essential marriage tie.

After marriage a divorce can be obtained by a Gurung (and often amongst Magars, too) by going through a ceremony called "Sinko Dago" or "Sinko Pangra," but both the husband and wife must agree to this. A husband has to pay R40 for his divorce, and the wife R160 Two pieces of split bamboo are tied together, placed on two mud balls, and the money is put close by If either party takes up the bamboos, breaks them, and picks up the money, the other party can go his or her way in peace and amity, and marry again legally.

In Nepāl, Lamas, assisted by Giabrings, fulfil the priestly function of the Gurungs, both of the Chārjāt and the Sōlahjāt, but in our regiments Gurung marriage ceremonies are performed by Brāhmans They say with true philosophy, "*Jaisā dēs, waisā bhēs,*" which might be translated as "Do in Rome as the Romans do"

In Nepāl no ceremony, whether that of marriage, burial, or naming a child at birth, is performed until the officiating Lama has determined the propitious moment by consultation of astrological tables, and by casting the horoscope On this much stress is laid In the marriage of Gurungs some ceremony resembling the *Añcal Gathā* is performed by the Lamas, and red lead is sprinkled by the bridegroom over the head of the bride This completes the actual ceremony All friends and relations are supposed to look away from the bride whilst the red lead is actually being sprinkled This ceremony is called "*Sindūr halnu,*" "to sprinkle red lead"

A Magar will not allow his daughter to marry into the clan from which he may himself have taken a wife, but Gurungs have no objection to this Neither Magars nor Gurungs, however, will take wives from the clan they may belong to themselves

Deaths and mourning—*Dukkhā baknu,* "to mourn"—In our regiments, on the death of a near relative, leave is granted for 13 days. For a father the son mourns 13 days If an unmarried daughter dies, the father mourns 13 days, unless she is still sucking her mother's breasts, when he would only mourn for 5 days. If a married daughter dies, the father mourns her for one day only, but the father-in-law will mourn for 13 days Men shave their heads, lips, cheek, chins, and eyebrows for parents, also for an elder brother if both parents are dead, but not otherwise

Men only shave their heads for sons, younger brothers, and daughters if unmarried.

On the death of a Gurung in his own country he is buried. The following ceremony takes place:—The body is wrapped round with many folds of white cloth, pinned together by splinters of wood, it is then carried by friends and relations to the graveyard At the entrance of the cemetery it is met by the officiating Lama, who, dressed in a long white garment, walks round the cemetery, singing a dirge, and the body is carried behind him until he stops opposite the grave It is next lowered into the grave, and then all friends and relations are supposed to throw a handful of earth upon the body, after which the grave is filled up, and stones placed above

In our service Magars and Gurungs on death are either buried or burned (but nearly always buried), according to the wish of the nearest relative If they die either of cholera or of small-pox, they are invariably buried Every regiment, if possible, should be provided with a cemetery The men much appreciate this

Magars and Gurungs are exceedingly superstitious The most ordinary occurrences of every-day life are referred by them to supernatural agency, frequently to the malevolent action of some demon. These godlings have in consequence to be continually propitiated. Among the minor Hindu deities, Diorali, Chanḍī, and Dēvī, are those specially worshipped in Gurkhā regiments Outbreaks of any epidemic disease, such as cholera or small-pox, are invariably regarded as a malign visitation of Diorali or Dēvī When going on a journey no one will start on an unlucky day of his own accord After the date has been fixed, should any unforeseen occurrence prevent a man from starting, he will often walk out a mile or two on the road he intended taking and leave a stick on the ground, as a proof of his intention having been carried out

In March 1889 a Gurkhā woman died of cholera in the Gōrakhpur recruiting depôt. Every Gurkhā officer, non-commissioned officer, and man at the depôt at once subscribed. The recruiting officers gave their share, and with the proceeds three goats, three fowls, four pigeons, and food of sorts, were purchased Of these, one goat and the four pigeons were let loose, and the food thrown away in the name of Dēvī, and the balance of animals were sacrificed to her, and then divided and eaten. Before killing the animals, they all prayed together—"Oh, mother Dēvī, we kill these beasts in thy name, do thou in return keep away all sickness from us."

As no fresh case occurred, although there was some cholera about in the district, all the Gurkhās in the depôt were more firmly convinced than ever that this was due entirely to their having propitiated Dēvī

Every Gurkhā regiment has a shrine to Diorali, and on the seventh day of the Dasahrā this is visited by the whole battalion in state procession.

Festivals.—The following is a table of the festivals observed by Gurkhās in our service, with the leave allowed —

Basant Pañcamī (in honour of Spring)	1 day
Çivarātrī	1 „
Hōlī (carnival)	9 days.
Snān Saŋkrānti	1 day
Rikhī Tarpan	1 „
Janam Aṣṭamī (called Janmāṣṭamī)	1 „
Dasahrā (called Dasin)	10 days.
Diwālī (called Tiwār, the feast of lamps in honour of the goddess Bhawānī, at new moon of month of Kārttik)	4 „
Maghiā Saŋkrānti (Hindū New Year)	1 day

The ceremonies at these festivals and their observance are, with a few minor points, the same as in Hindustan

These holidays should not in any way be curtailed or interfered with but should be granted in full

The Dasahrā is the chief festival of the Gurkhās, and they endeavour to celebrate it whether in quarters or the field Great preparations are made for it in procuring goats, buffaloes, etc, for the sacrifice. Every man in the regiment subscribes a certain amount towards the expenses The commanding officers often give a buffalo or two, and every British officer subscribes a certain amount also The arms of the regiment are piled, tents erected, and spectators invited to witness the dexterity of the men in severing the heads of buffaloes, the children performing the same office on goats The period of this festival is considered an auspicious time for undertaking wars, expeditions, etc.

Caste rules with regard to food only apply to one description, *viz.*—" dāl and rice " *All* other food, excepting " dāl and rice," *all* Gurkhās will eat in common With Magars, unmarried Ṭhākurs, and with Gurungs, it is not necessary to take off *any* clothes to cook, or to eat *any* kind of food including " dāl and rice " In Nepāl the Khas need only remove their caps and shoes to cook or eat their food Should a Brāhman of the Opadhiā class prepare " dāl and rice," all castes can eat of it Magars and Gurungs will not eat the above if prepared by a Jaici Brāhmaṇ Superior castes will not eat dāl and rice with inferior ones.

In our regiments men generally form little messes of their own varying in size from two or three to a dozen As long as they are unmarried, Gurkhās of the same caste will eat everything together. All Gurkhās will eat "shikār" in common, a word they use for all description of meat.

No Gurkhās, except some menial classes, will eat cows, nīlgāi, or female goats. Gurungs eat buffaloes in their own country, though they will stoutly deny it if accused All kinds of game are prized by Gurkhās, deer of all varieties, pigs, porcupines, pea-fowl, pigeons, pheasants, etc., etc, but beyond all things a Gurkhā likes fish

Food cooked in ghee, including "rice," but not "dāl," is eaten by all classes in common

Thākurs who have not adopted the thread will eat everything with Magar and Gurung

All classes will drink water from the same masak, which, however, should be made of goat-skin.

Brian Hodgson gives the following true and graphic account of the contrast between the way the Gurkhā eats his food and the preliminary ceremonies which have to be observed by the orthodox Hindū —

> "These highland soldiers, who despatch their meal in half an hour, and satisfy the ceremonial law by merely washing their hands and face and taking off their turbans before cooking, laugh at the pharisaical rigour of the Sipāhīs, who must bathe from head to foot, and make pūjā ere they can begin to dress their dinners, must eat nearly naked in the coldest weather, and cannot be in marching trim again in less than three hours
>
> In war, the former readily carry several days' provisions on their back the latter would deem such an act intolerably degrading The former see in foreign service nothing, but the prospect of glory and spoil the latter can discover in it nothing, but pollution and peril from unclean men and terrible wizards, goblins, and evil spirits In masses the former have all that indomitable confidence, each in all, which grows out of national integrity and success the latter can have no idea of this sentiment, which yet maintains the union and resolution of multitudes in peril better than all other human bonds whatsoever, and once thoroughly acquired, is by no means inseparable from service under the national standard
>
> In my humble opinion they are, by far, the best soldiers in Asia, and if they were made participators of our renown in arms, I conceive that their gallant spirit, emphatic contempt of *madhēsiās* (people residing in the plains), and unadulterated military habits, might be relied on for fidelity, and that our good and regular pay and noble pension establishment would serve perfectly to counterpoise the influence of nationality so far as that could injuriously affect us"

The above was written by Mr Brian Hodgson in 1832, and 25 years later, namely, in 1857, he wrote —

> "It is infinitely to be regretted that the opinions of Sir Henry Fane, or Sir Charles Napier, and of Sir John Lawrence, as to the high expediency of recruiting largely from this source, were not acted upon long ago"

On service the Gurkhās put aside the very small caste prejudices they have, and will cook and eat their food, if necessary, in uniform, and with all accoutrements on

Gurkhās will eat all and every kind of vegetables and fruit. They have a great partiality for garlic and pepper, and are very fond of potatoes, cabbages, cucumbers, and squash (kadū). They will smoke any English or Indian tobacco, and are very fond of cheroots. They will smoke out of any English-made pipe, even if with a horn mouth-piece, although they are likely to make a little fuss over the latter, just to save their consciences

Arms.—The kukrī, a short, curved, broad-bladed, and heavy knife, is the real national weapon of the Gurkhās, and it is worn by all from the highest to the lowest In our regiments they are carried in a frog attached to the waist-belt From the beginning of the handle to the end or point of the blade it averages about 20 inches in length

Where wood is plentiful, they are very fond of practising cutting with the kukrī, and they will cut down with one blow a tree the size of an ordinary man's arm A really skilful cutter will cut off slice after slice from the end of a piece of green wood, each slice being not thicker than an ordinary piece of shoe leather They call this "chinnu," to slice off

They are also skilful with the *gulēl*, (pellet bow) knocking down and killing the smallest birds with ease All who can manage to raise the funds endeavour to possess themselves of some sort of fire-arm.

Dress.—The national dress of the Gurkhās of the poorer class, such as we enlist, is one that shows them off to the greatest advantage, and consists of the following —

A piece of cloth (*langotī*) worn, as natives of India do, round the loins, etc A thin waistcoat fitting tight and buttoned all the way up to the throat A long piece of cloth, which is often a pagrī, and is wrapped round the waist, and by which the kukrī is carried A pair of brown Gurkhā shoes, as described further on

A black round cap, high on one side and low on the other, and finally, a kind of thin blanket or thick sheet, called Khadi, which is worn as follows —The two corners of the breadth are first taken One is carried over the right shoulder and the other is brought up under the left arm, and the two corners tied together about the centre of the chest.

A third corner, the one diagonally opposite No 1, is now taken, and brought over the left shoulder and tied in a knot with the fourth corner, which is brought up under the right arm and opposite the centre of the chest

This dress leaves the arms quite bare from above the elbows, and the legs are naked from halfway down to the knees, thus showing off his grand limbs.

The blanket, by being tied as described above, forms a kind of large bag, which extends all the way round the back, and in this Gurkhās very often carry their goods and chattels.

The Gurkhā shoe is square-toed, fits well up over the instep, passes just under the ankle, and then round and pretty high up above the heel It is made of rough-looking but good brown leather, and all sewing in it is done with strips of raw hide. It is an excellent, durable shoe, is not affected by water in the same way that an ordinary native shoe of India is, and it is much less liable to come off in boggy ground

When the sun is very hot, Gurkhās will often unwind their waist-belt and tie the same over their heads in the shape of a pagrī, taking it off again in the afternoon, when it begins to cool down again

The upper classes of Nepāl and most of the residents of Kāṭhmānḍū wear the following —

The above-mentioned national cap, or one much like it.

A kind of double-breasted frock-coat, called *caubandī*, fitting tight everywhere, especially over the arms, fastened inside and outside by means of eight pieces of coloured tape, four inside and four outside The four outside pieces of tape when tied show two on the left breast and high up, and the other two on the left side about level with the waist

A white or coloured waist-cloth or pagrī, with the invariable kukrī, a pair of pyjamas very loose down to just below the knee, and from thence fitting the leg down to the ankle, and a pair of the national shoes

Under the coat is worn a shirt, of which three or four inches are invariably allowed to show They never tuck their shirts inside their pyjamas.

The frock-coat and pyjamas above mentioned are made of a double layer of a thin shiny cotton cloth. Between the two layers a padding of cotton wool is placed, and these secured by parallel lines of sewing which run close to each other To make this still more secure, diagonal lines of sewing are also resorted to. This makes a very comfortable and warm, but light, suit

Amusements and sports.—Gurkhās delight in all manly sports,—shooting, fishing, etc ,—and are mostly keen sportsmen and possess great skill with gun and rod They amuse themselves in their leisure hours either in this way in the field, or in putting the shot, playing quoits or foot-ball, and they are always eager to join in any game with Europeans

General Sir Charles Reid, K C B , says —

> "All Gurkhās are keen sportsmen and are never so happy as when they are on a tiger's track A man I lost at Delhi, had killed twenty-two on foot, they never waste a shot, they call ammunition 'Khazānā,' 'treasure'"

They are good gardeners, but very improvident, as they never will save up seed for the next season's sowing. They are very fond of flowers, and will often go a long distance to procure some. They often make necklaces of flowers, which they wear, and will also put flowers away in a glass of water in their barracks.

General character.—As compared with other orientals, Gurkhās are bold, enduring, faithful, frank, very independent, and self-reliant, in their own country they are jealous of foreigners and self-asserting They despise the natives of India, and look up to and fraternize with Europeans, whom they admire for their superior knowledge, strength, and courage, and whom they imitate in dress and habits.

They have the following saying —"*Tōpīwār kāmwār, Luggīwār khannēwār*"—"The cap-wearer works, the *lungi*-wearer eats,"

They are very jealous of their women, but are domestic in their habits, and kind and affectionate husbands and parents. As a consequence, their wives are less shy and reserved, and have more freedom, and reciprocate their affection, carefully looking after their uniform and all culinary and domestic matters

As a rule, recruits on joining are very unsophisticated, very truthful, but dirty, and the first lesson that has to be taught them is that "cleanliness is next to godliness"

The great vice of Gurkhās is gambling, to which they are greatly addicted Though hot-tempered and easily roused, they are in general quiet, well-behaved men, and extremely amenable to discipline With a firm just hand over them, punishments are rare

Gurkhās are capable of being polished up to a degree of smartness that no native troops can approach, and which cannot be much surpassed even by British troops No officer can be too strict with them in parades, but they hate being "nagged at"

Education.—In Kāṭhmāndū good schools exist, in which English and Hindī are taught, but our recruits, being almost entirely drawn from the agricultural classes, are quite ignorant of reading or writing In our battalions schools exist for their instruction in reading, writing, and doing accounts, both in English and vernacular, and these are generally well attended Numbers of men learn to read and write from friends in their barracks It may seem strange, but it is an undoubted fact, that a number of recruits are yearly obtained who profess to enlist merely for the sake of learning to read, write, and do accounts

Traditions.—The Gurkhā, from the warlike qualities of his forefathers, and the traditions handed down to him of their military prowess as conquerors of Nepāl, is imbued with, and cherishes, the true military spirit.

His physique, compact and sturdy build,, powerful muscular development, keen sight, acute hearing, and hereditary education as a sportsman, eminently capacitate him for the duties of a light infantry soldier on the mountain side, while his acquaintance with forest lore makes him as a pioneer in a jungle almost unrivalled, whilst his national weapon, the kukrī, has in Burma and other places proved itself invaluable.

The bravery displayed by the Gurkhās in their contests with the British has already been alluded to, and their own traditions afford ample proof of the dogged tenacity with which they can encounter danger and hardship

The return of the Nepāl army from Diggarcheh in the year 1790, amongst other instances, affords a distinguished proof of their daring and hardihood The following extracts from Captain T Smith's book are very characteristic —

"At Bhartpur it was an interesting and amusing sight to witness the extreme good fellowship and kindly feeling with which the Europeans and the Gurkhās mutually regarded each other A six foot two grenadier of the 59th would offer a cheroot to the "little Gurkhee," as he styled him, the latter would take it from him with a grin, and when his tall and patronising comrade stooped down with a lighted cigar in his mouth, the little mountaineer never hesitated a moment in puffing away at it with the one just received, and they were consequently patted on the back and called "prime chaps"

At the assault of Bhartpur, the Goorkhas were ordered to follow in after the 59th

These directions were obeyed, with the exception of going in with them instead of after them, for when the British grenadiers with a deafening "hurrah" made their maddening rush at the breach, at that glorious and soul stirring moment it was impossible to restrain them, and they dashed into the thick of it

In the morning after the storming of Bhartpur, when being praised for their gallantry by their British comrades, they returned the flattering partiality of the latter by the following characteristic remark "The English are brave as lions, they are splendid sepoys, and *very nearly* equal to us!"

The following story is given as illustrative of their coolness and amenability to discipline —

" A tiger had been seen within a few miles of Dehra, and Colonel Young (then Captain and the gallant commanding officer of the Simoor battalion), accompanied by Colonel Childers, of Her Majesty's 11th Dragoons, mounted an elephant and hastened to the spot They, however, were unsuccessful in rousing him, and after a long and tedious search were returning home

A Gurkhā sepoy was following the elephant with his gun on his shoulder, when he suddenly dropped on one knee and presented his rifle as if in the act to fire Having, however, roused the attention of the sportsmen, he did not pull the trigger but kept his gun fixed in the same position He had suddenly caught sight of the fiery eyes of the tiger who was crouching among the underwood, within three paces of his gun in this situation they steadily regarded each other The elephant was immediately pushed up close to the kneeling Gurkhā, but neither of the sportsmen could succeed in catching a glimpse of the animal In order, if possible, to observe the direction more accurately, Captain Young called out 'Recover arms' The sepoy came to the 'Recover' as calmly and collectedly as if on his own parade 'Present.' Down went the gun again, this was repeated, but still the tiger was invisible

Captain Young exclaimed 'That gallant fellow shall not be left unassisted,' and in a moment dropped from the elephant and placed himself close to the sepoy He looked along the levelled barrel, but to no purpose; the brute was not to be distinguished

Cocking his gun, therefore, he told the Gurkhā to fire, there was a terrific roar, a rush forward for one instant, and all was still When the smoke had just cleared away, there lay the tiger perfectly dead The ball had struck the centre of his forehead and entered his brain"

Dr Oldfield in his book points out that there is not a single instance of a Nepāl chief taking bribes from, or selling himself for money to the British or any other State This loyalty to themselves is only equalled by their loyalty to us during the fiery ordeal of the Mutiny, the records of which, as well as of Ambeyla, of the Kabul campaign, and many other wars and battles, amply testify the value of the services rendered us by our Gurkhā regiments since incorporation in our army in 1815

Their fighting qualities, whether for sturdy, unflinching courage or enduring *élan*, are *nulli secundus* amongst the troops we enrol in our ranks from the varied classes of our Indian Empire, and no greater compliment can be paid to their bravery than by quoting one of their sayings—

Kafar hunan bhandā marnu ramrō!
"It is better to die than to be a coward!"

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(NOS. I TO IV.—1894)

EDITED BY THE

NATURAL HISTORY SECRETARY.

> "It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease." SIR WM. JONES.

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JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Vol. LXIII. Part II.—NATURAL SCIENCE

No. 1.—1894.

I.—*On new or little-known Butterflies from the Indo-Malayan region.*—*By* Lionel de Nice'ville, F. E. S., C. M. Z. S., &c.

(With Plates I, II, III, IV and V.)

[Received February 10th;—Read March 7th, 1894.]

Family NYMPHALIDÆ.

Subfamily Satyrinæ.

1. Mycalesis (*Satoa*) maia, n. sp., Plate I, Figs. 1, ♂, 2, ♀.

Habitat: Battak Mountains, N.-E. Sumatra.

Expanse: ♂, 1·8 to 1·9, ♀, 2·1 inches.

Description: Male. Upperside, *both wings* black, glossed with vinous in some lights, a narrow waved marginal line. *Forewing* with the costa, apex broadly, and outer margin decreasingly paler, a small black white-pupilled ocellus in the anterior discoidal interspace, sometimes with a smaller ocellus attached to it posteriorly; a large round black spot in the first median interspace, outwardly bounded by a pale line. *Hindwing* with a broad whitish patch on the costa at the base of the wing, the outer margin narrowly pale. Underside, *both wings* fuscous, the outer margin bears a narrow waved black line, then a waved narrow ochreous (in some specimens violet) line, then a nearly straight ochreous (or violet) line, the extreme margin narrowly black. *Forewing* with the apex washed with ochreous; a subapical black ocellus, sometimes with a second smaller one attached to it posteriorly, and a very large posterior ocellus, these ocelli have a white pupil, the black portion surrounded by an ochreous, a black, and lastly a violet ring; the inner margin broadly whitish *Hindwing* with a basal nearly straight and a discal irregular violet fascia, a series of seven ocelli towards the margin similar to those on the forewing, but the outer rings of all of them joined and forming a continuous violet bordering to the whole series of ocelli, the first, fourth and sixth ocelli of medium size, the second, third and seventh small, the fifth the largest. FEMALE. UPPERSIDE, *both wings* much paler than in the male *Forewing* with an indistinct subapical broad dull ferruginous fascia, reaching from the costa to the first median nervule, otherwise similar to the male, except that all the secondary sexual characters found in the male are wanting.

Nearest to *M. maianeas*, Hewitson, the only other species in the subgenus *Satoa*, described by Hewitson from Malacca [?] and Sarawak, of which the female has alone been figured, and from which the same sex of *M maia* appears to differ in having a subapical ocellus on the upperside of the forewing, and the "orange band" instead of being very richly coloured and prominent is reduced to an obscure cloud on both surfaces.

This species appears to occur not uncommonly in the mountains of N-E Sumatra, and there are numerous specimens in Dr. Martin's collection as well as in my own. I possess specimens taken in July and December Both Mr Henley Grose Smith ("Head Hunters of Borneo"), and Dr. B. Hagen ("Die Pflanzen- und Thierwelt von Deli auf Der Ostkuste Sumatra's") record *M maianeas*, Hewitson, from Sumatra, but this species is probably the one meant.

Subfamily MORPHINÆ.

2. STICHOPHTHALMA SPARTA, n. sp., Plate I, Fig. 4, ♂.

HABITAT Manipur.

EXPANSE ♂, 5 0 inches

DESCRIPTION MALE UPPERSIDE, *both wings* deep rich reddish-fulvous or ferruginous *Forewing* with the irregular discal black line of the underside shewing through by transparency, the apical area widely pale fulvous, this pale area extends from the submarginal hastate black markings to just within the discal black line, it is very wide on the costa, but dies away to nothing before reaching the first median nervule, a series of five submarginal hastate black markings, one in each interspace from the upper discoidal nervule to the submedian nervure, increasing progressively in size from the anterior to the posterior marking, a large black patch at the apex, a submarginal fulvous line, beyond which is a narrower anteciliary black line, both reaching from the inner angle to the lower discoidal nervule; the area enclosed by the coalescing of the hastate markings forms a series of six rounded spots regularly increasing in size, the anterior spot the smallest, the posterior one the largest, these spots are of a slightly darker shade than the pale fulvous apical area, but not so dark as the dark, rich reddish-fulvous of the rest of the wing. *Hindwing* with the abdominal and outer margins rather paler than the rest of the wing, a submarginal series of seven black markings, of which the anterior one is a small lunule with its concave edge directed towards the base of the wing, the next five markings are hastate-shaped,* increasing in size from the anterior one to the posterior one in the first median interspace, the seventh posterior marking somewhat quadrate in form, and occupying the whole width of the submedian interspace, a fine black anteciliary thread. UNDERSIDE, *both wings* of a reddish-fulvous of not quite so rich a shade as on the upperside. *Forewing* with a small irregular black marking towards the base of the cell, a highly irregular and zig-zag black line crosses the middle of the cell and extends both to the costa and to the submedian nervure, the posterior portion of the line is broken and shifted outwardly below the median nervure; the upper, middle, and anterior half of the lower disco-cellular nervule defined by a black line, an irregular discal black line from the costa to the submedian nervure, just touching the lower end of the cell, beyond the line is a series of five somewhat cordate, reddish ocelli, each ocellus centred with a whitish lunule and bounded by a fine whitish and then a fine black line, the four anterior ocelli equal-sized, the fifth posterior one in the first median interspace a little larger, beyond these ocelli is another irregular black line from the costa to the inner margin, this line is narrower and paler than the discal one, the space between these two lines is anteriorly somewhat paler than the rest of the wing, a submarginal nebulous straight blackish band; a very fine anteciliary black line. *Hindwing* with an irregular sub-basal and a discal black line, the latter posteriorly curving round and almost meeting the posterior end of the former, both terminating above the anal angle on the submedian nervure, a series of five ocelli on the disc similar to those in the forewing, the posterior one the largest and rather misshapen, the anterior one the next largest, the three in the middle nearly equal sized, the outer discal fulvous line and blackish submarginal band as in the forewing; a small oval deep black spot at the anal angle, with a black cloud above it reaching to the posterior ocellus; an anteciliary black thread *Antennæ* black. *Body* throughout ferruginous

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* The late Professor J. O. Westwood well described these peculiar and characteristic markings of the genus *Stichophthalma* as being built up of a much curved lunule on the margin coalescing inwardly with a spear-shaped spot. To me these markings have a curious likeness to the black silhouette of the head and shoulders of a human figure, especially the third marking from the anal angle of the hindwing in the specimen here figured.

Nearest to *S* *howqua*, Westwood, var *suffusa*, Leech,* from Western China, differing in the forewing on the upperside in the pale apical area being very much smaller, not extending into the cell as it does in *S. howqua*, var *suffusa*, on the hindwing the hastate markings in *S* *sparta* are well formed, in Mr. Leech's species they have lost all shape, having coalesced into an almost solid black band. On the underside the ground-colour in *S. howqua*, var. *suffusa* is pale greenish, in *S* *sparta* it is ferruginous, but this may be only a sexual difference; but in true *S* *howqua* and its named variety the outer discal line and the submarginal band on both wings are half the distance apart that they are in *S* *sparta*, and they have six and sometimes seven ocelli on the forewing, while *S* *sparta* has only five.

Described from a single example purchased from a telegraph signaller employed at Manipur

Subfamily NYMPHALINÆ.

3. HERONA PRINGONDANI, Fruhstorfer, Plate III, Figs. 5, ♂, 4, ♀.

H *pringondani*, Fruhstorfer, Ent. Nach, vol xix, p. 314 (1893).

HABITAT Java

EXPANSE ♂, 2·9, ♀, 2 9 to 3·1 inches

DESCRIPTION · MALE. UPPERSIDE, *both wings* dull brown, slightly tinged with ochreous *Forewing* with an indistinct pale oblique band across the end of the discoidal cell, a broad very irregular discal white band extending across the wing, divided into oblong spots by the brown veins crossing it, the four anterior portions from the costa to the third median nervule are placed outwardly obliquely, the first portion on the costa is very small, the second is larger, the third is the largest, the fourth not quite so long as the third but broader, the four remaining portions of the band are placed parallel to the outer margin, the upper portion in the second median interspace is oval in shape, the second portion is the largest of all and has a small round black spot in its middle, the third is smaller than the second but bears a large round black spot, the posteriormost portion on the inner margin is short, two subapical crescent-shaped white spots placed obliquely, divided by the upper discoidal nervule. *Hindwing* with a broad even discal white band extending from the costa to near the abdominal margin, divided by a highly irregular blackish fascia which is broken at the third median nervule; an indistinct ochreous cloud across and beyond the end of the cell; some whitish spots on the margin towards the apex. UNDERSIDE, *both wings* with a highly irregular narrow discal brown line extending across the surface, commencing above the anal angle of the hindwing and ending in a rather broad dark fascia at the costa of the forewing. *Forewing* whitish, the inner margin very broadly extending half way across the discoidal cell pale ochreous, an oblique brown band across the middle of the cell, a short one at the end of the cell, the white band of the upperside indistinctly defined, but the two black spots divided by the first median nervule distinct but smaller than on the upperside. *Hindwing* whitish mottled and clouded with pale ochreous-brown, an oval conspicuous brown spot in the middle of the cell placed against the subcostal nervure FEMALE shaped and marked precisely as in the male, and can only be distinguished therefrom by the stouter abdomen and the structure of the forelegs

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* Butt. from China, Japan, and Corea, p 114, pl. i, fig. 8, *female* (1892).

Nearest to *H schoenbergi*, Staudinger,* from South-East Borneo, from which it appears to differ in the forewing in the discal white band being broader and continuous throughout, in *H schoenbergi* it is broken up into a double series of spots, the outer series is white, the inner pale ochreous, in the hindwing the discal white band in *H. pringondani* is placed much farther from the outer margin than in *H schoenbergi*, and the black fascia it bears is strongly broken and dislocated in the middle, while in *H schoenbergi* the white discal band approaches much nearer the margin, and the black fascia across the band is continuous throughout and divides the band nearly equally, lastly, there is a small round black spot in the middle of the first median interspace in *H. schoenbergi* which is wholly wanting in *H pringondani*

Described from one male and two females received from Mr H Fruhstorfer, to whose courtesy I am indebted for a copy of his description of the species, which reached me just in time to enable me to substitute his name for the one I had proposed for this interesting *Herona.*

4 HERONA SUMATRANA, Moore, Plate III, Fig 7, ♀.

H sumatrana, Moore, Trans Ent Soc Lond, 1881, p 308.

HABITAT N.-E Sumatra

EXPANSE ♂, 3·0 to 3·1; ♀, 3·1 to 3·4 inches

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* *Herona scnoenbergi*, Staudinger, Iris, vol iii, p 337, n 3, pl iii, fig. 3 (1890), vol. iv, p. 84 (1891). The figure is probably taken from a female specimen This may be the species referred to by Mr W Doherty in Journ A. S B, vol lviii, pt. 2, p. 122 (1889) thus —" *Euthalia (Felderia) macnairi*, Distant, is mimicked by a new and remarkable species of *Herona* (?) of which both sexes were taken by me in Borneo, and are now in Mr Neumoegen's possession "

DESCRIPTION · MALE. UPPERSIDE, *both wings* dull brown, slightly tinged with ochreous. *Forewing* with a discal macular band consisting of seven separated portions, the four anterior ones elongated, whitish, dusted with fuscous, the three posterior ones rounded, white, tinted with violet in some lights, three subapical small violet-white spots arranged in an equilateral triangle, with the apex of the triangle towards the outer margin of the wing, a large quadrate ochreous spot in the first median interspace within the discal band, a smaller one in the submedian interspace bisected by the internervular fold, a narrow streak on the inner margin *Hindwing* with a broad even discal white band, strongly tinted with violet in some lights, extending from the costa to near the abdominal margin, divided by a highly irregular fascia, anteriorly fuscous, posteriorly broader and paler, the fascia broken at the third median nervule, a complete marginal series of whitish spots between the veins. UNDERSIDE, *both wings* marked and coloured almost exactly as in *H pringondani*, Fruhstorfer, from Java. FEMALE, as in the male, but the violet suffusion of the upperside rather more prominent

Closely allied to *H schoenbergi*, Staudinger, from South-East Borneo, and to *H. pringondani.* It differs from both in the violet reflections of the upperside, it agrees with the latter in the fuscous fascia of the hindwing on the upperside placed on the discal white band being strongly broken and dislocated in the middle, thereby differing from the former. The markings of the forewing differ a good deal in detail in *H. pringondani* and *H. sumatrana*, as will be noted by a reference to the figures and descriptions of the two species

Described from two males and three females in Dr Martin's and my collection, one of which was taken in the virgin forest at Selesseh in September. It may be a mimic of the common species of *Euthalia* (*Felderia*) of the group of *cocytina*, Horsfield.

5. NEPTIS CLINIOIDES, n. sp., Plate I, Fig. 8, ♂.

HABITAT: Battak Mountains, N.-E. Sumatra.

EXPANSE: ♂, ♀, 2·2 inches.

DESCRIPTION MALE and FEMALE UPPERSIDE, *both wings* deep black, markings creamy-white *Forewing* with the discoidal streak wide, joined to the triangular spot beyond, just "nicked" or indented anteriorly at the end of the cell; the discal series consists of seven spots, placed in two groups, the upper of three, the lower of four spots, the groups well separated, the uppermost spot very small, linear, the two following large, conjoined, divided only by the upper discoidal nervule, the four posterior spots large, contiguous, the submarginal macular line obsolete in the male, composed of small linear streaks in the female.

Hindwing with a broad discal band, widest on the costa, gradually and evenly tapering to the abdominal margin; the submarginal band composed of prominent narrow portions, an indistinct pale line between the discal and submarginal bands, a similar marginal line. UNDERSIDE, *both wings* reddish-brown, all the markings broader than on the upperside. *Forewing* with three marginal lines, the inner one very narrow, the middle one the broadest, on the margin are two white spots divided by the lower discoidal nervule, and two others divided by the first median nervule. *Hindwing* with a short basal streak on the costa, behind which is a longer curved one running into the discal band; between the discal and submarginal bands is a narrow straight line; two lines on the margin, the outer one the broader.

Perhaps nearest to *N. clinia*, Moore,* from Bengal (*Moore*) and Siam (*Druce*), known to me by the figure and description only, from which it appears to differ in having the discoidal streak and spot beyond in the forewing joined instead of separated, the discal spots larger, the discal band on the hindwing narrower, tapering, instead of being of equal width throughout, the submarginal band creamy-white like the other markings instead of being "brownish-white" From the figure of *N. nandina*, Moore, it differs in the discoidal streak and spot beyond of the forewing being continuous, the discal series of spots seven in number instead of six, they are also larger and conjoined instead of being well separated, the markings of the hindwing on both surfaces very similar.

Described from two examples in my collection, taken in June, there are numerous examples in Dr Martin's collection.

6. NEPTIS NISÆA, n. sp, Plate I, Fig 9, ♂.

HABITAT: Java

EXPANSE. ♂, 1·3 inches.

DESCRIPTION. MALE. UPPERSIDE, *both wings* deep black with pure white markings. *Forewing* with a narrow streak in the discoidal cell well separated from the triangular spot beyond, the discal series consists of six spots, placed in pairs, each pair conjoined, divided only by the crossing vein, a submarginal series of small linear spots more or less obsolete about the third median nervule. *Hindwing* with the discal band narrow on the abdominal margin gradually and regularly increasing in width to the costa; the submarginal band consists of six very narrow well separated spots; there is also an extremely faint line between the discal and submarginal bands, and a similar marginal line UNDERSIDE, *both wings* chocolate-brown with pure white markings. *Forewing* with the inner margin broadly fuscous; the discoidal streak very wide; the anterior pair of spots of the discal series continued to the costa, the margin bears three interrupted series of spots. *Hindwing* with a costal band at the base of the wing; an obscure grey fascia posterior to this; the discal band very narrow on the abdominal margin, very broad on the costa, followed by a grey line, the spots of the submarginal band wider and more lunular than above; two prominent marginal lines, the outer the wider

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* Proc. Zool. Soc. Lond., 1872, p. 563, pl. xxxii, fig. 5, *male*.

It is difficult to say to what group *N. nisæa* belongs The discal band of the forewing being divided into three pairs of spots allies it to the *N. columella* group, the pure white markings and general *facies* ally it to the *N. nata* group It is also near to *N. nandina*, Moore, originally described from Java and Darjeeling, but the middle pair of spots of the discal series on the forewing being conjoined instead of well separated will immediately differentiate between the two species. On the whole it appears to be nearest to *N. pampanga*, Felder, from N.-W Luzon, as figured in Herr Georg Semper's "Schmett. der Philippinischen Inseln," pl. xxix, figs 6, *male*, 7, *female*, from which it may instantly be known by the discal band of the hindwing on the underside being half the width at the point where it touches the abdominal margin that it is in that species.

Described from two examples received from Herr H Fruhstorfer.

7. ARGYNNIS NIPHE, Linnæus, Plate III, Figs. 1 and 2.

The gynandromorphous example of *A. niphe*, Linnæus, here figured was reared by Mrs S Robson at Bankipur, Behar, Northern India, and emerged from the pupa on the 2nd March, 1893. It is thus referred to* by that lady in describing her experiments in breeding this species —"One *lusus naturæ*, a male, had one wing as in the ordinary male, and the other as in the ordinary female!"

This insect has the right-hand pair of wings masculine, the left-hand pair feminine In the masculine half of the insect there is, however, in the forewing on the upperside a slight admixture of feminine coloration, the round black spot in the lower discoidal interspace in the outer discal series of spots has a streak of white on either side of it, and on the disc are many irregular blue-black streaks more or less connecting the black spots The hindwing is quite normal. On the underside of the masculine forewing there is the commencement of a well-defined white subapical band as in a normal female example, and the discal black spots have, as on the upperside, some irregular blue-black markings attached to them. The hindwing on the underside is quite normal. The feminine pair of wings are smaller than the masculine pair, and have all the markings and coloration of an ordinary female. The masculine antenna is 14 mm. in length; the feminine is much shorter, being only 10·5 mm. in length. Externally the organs of generation are masculine, I have not dissected them to ascertain their internal structure.

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* Journ. Bombay Nat. Hist. Soc., vol. viii, p. 152 (1893).

Gynandromorphous butterflies are very rare. In all my experience I have met with only one other example in India, a specimen of *Cyllogenes suradeva*, Moore, collected by the late Mr. Otto Möller, and now in Mr. J. H. Leech's possession. The late Professor Westwood has figured two separate examples of *Cirrhochroa aoris*, Doubleday and Hewitson; Mr. George T. Baker has figured and described the primary sexual characters of an *Eronia (Nepheronia) hippia*, var *gœa*, Felder, and Herr Georg Semper an example of *Papilio castor*, Westwood, these are the only other Indian gynandromorphous butterflies of which I am aware.

8. EUTHALIA SAKII, n. sp., Plate III, Fig. 3, ♀.

HABITAT: N.-E. Sumatra.

EXPANSE ♀, 3·1 inches

DESCRIPTION · FEMALE. UPPERSIDE, *both wings* pale ochreous-brown. *Forewing* with a narrow fuscous line crossing the discoidal cell near the base, continued to the submedian nervure; a large ring-spot in the middle and another at the end of the discoidal cell; a series of five semi-transparent sullied-white spots between the veins beyond the end of the cell, from the subcostal nervure to the first median nervule, the anteriormost spot linear; the second also linear, but a little longer than the first, the third spot triangular, the smallest of the three, the fourth spot larger than the third, cordate, the fifth the largest of all, also cordate; beyond this series of spots is a broad irregular diffused violet-whitish-powdery fascia, narrow at the costa, wide on the inner margin, bearing a series of dark sagittate markings placed between the veins from the lower discoidal nervule to the submedian nervure; a very small fuscous ring-spot in the submedian interspace placed at the point where the first median nervule originates. *Hindwing* with a small fuscous spot in the middle of, and a much larger ring-spot closing the cell; a discal series of six spots similar to and in continuation of the series in the forewing, the three anterior ones large, cordiform, decreasing in size, placed in the costal, upper and lower subcostal interspaces, the fourth spot in the discoidal interspace almost obsolete and very small, the fifth and sixth spots in the median interspaces small; the outer margin broadly whitish washed with a metallic greenish-blue of a curious shade, and bearing a prominent dentated dark line in its middle. UNDERSIDE, *both wings* pale ochreous, all the markings similar to those on the upperside but much more prominent. *Hindwing* with the usual markings in and around the discoidal cell, otherwise as on the upperside. *Body* above and below concolorous with the wings. *Legs* pale ochreous.

E sakii is perhaps nearest to *E. merta*, Moore, described from China, a female of which I possess from Quang in the Malay Peninsula, but it differs in the discal series of five spots in the forewing having their outer ends more or less excavated, while in *E. merta* the exact reverse obtains, each spot being produced outwardly into a sharp point. In *E. sakii* the sagittate markings beyond the discal series of spots also in the forewing have their apices directed towards the base of the wing, in *E merta* towards the outer margin On the hindwing in *E. sakii* the submarginal dentated dark line is continuous, in *E. merta* it is replaced by a series of well-separated small round spots, and there are other minor differences between the two species.

Described from a single example in Dr. L. Martin's collection. I have named it after Saki, a highly intelligent Javan collector in Dr. Martin's service.

9. EUTHALIA (*Dophla*) IVA, Moore.

Adolias iva, Moore, Horsfield and Moore, Cat. Lep Mus. E I. C, vol. i, p 195, n 395 (1857), idem, id, Trans. Ent Soc Lond, new (second) series, vol v, p 78, n 36, pl viii, fig 2, *male* (1859), id, Butler, Proc Zool Soc Lond, 1868, p 602, n 14; *Euthalia iva*, de Nicéville, Butt of India, vol ii, p. 197, n. 491 (1886)

HABITAT: Darjeeling (*Moore*); Manipur.

EXPANSE · ♀, 4·5 inches

DESCRIPTION FEMALE. Differs from the male only in being somewhat larger, the forewing rather more elongated.

I have recently been so fortunate as to acquire by purchase a pair of specimens of this fine species. It was described as far back as 1857 by Mr Moore from Darjeeling. I am a little doubtful regarding this locality, as it is strange that within recent years this large species should not have been obtained in the Sikkim district, which is for butterflies perhaps the most completely explored of any in India. However, it may have occurred there in the middle of the century, and since become exterminated, as has its near ally, *E. durga*, Moore, owing to the enormous destruction of the virgin forests that has taken place for the cultivation of tea. *E. iva* comes into the group of *E. patala*, Kollar, *E. durga*, Moore, and *E. duda*, Staudinger, in which the sexes are very much alike, in that respect differing from *E nara*, Moore, and *E sahadeva*, Moore, in which the sexes differ greatly, the females of these two species being like both sexes of the former group.* My male specimen agrees very well with Mr. Moore's figure of the same sex, differing only in the lowest white streak of the discal series in the first median interspace in the forewing being slightly less elongated, and the spot in the middle of the submedian interspace of that wing being outwardly cleft only, instead of being completely separated into two spots.

10. EUTHALIA (*Dophla*) EION, n. sp, Plate III, Figs 8, ♂; 6, ♀.

HABITAT Java.

EXPANSE ♂, 2 8, ♀, 3 2 inches

DESCRIPTION MALE. UPPERSIDE, *both wings* fuscous, crossed by a common macular discal pale greenish-yellow band. *Forewing*, the band consists of seven well-separated spots, gradually increasing in size from the costal to the inner margin, the uppermost spot a little out of line with the rest, shifted inwardly towards the base of the wing, the spots all more or less rounded, the one in the submedian interspace cleft outwardly, a very small white subapical spot, a submarginal series of increasing obscure black spots placed between the veins *Hindwing*, the discal band consists of eight conjoined spots, the three uppermost pure white, each spot has its inner edge rounded, its outer edge brought to a point in the middle, a submarginal obscure black fascia, beyond which is a decreasing series of seven small round white spots, one in each interspace UNDERSIDE, *both wings* pale brown, glossed throughout with violet; the common discal band much as above. *Forewing* with a black ring-spot centred with crimson in the middle of the discoidal cell, a crimson line placed on the disco-cellular nervules, defined on both sides by a black line, some obscure linear black spots placed between the veins midway between the discal band and the outer margin *Hindwing* with a very small black ring-spot in the middle of the cell, a black line on either side of the disco-cellular nervules, a submarginal series of linear black spots much as in the forewing. FEMALE. UPPERSIDE, *both wings* much paler than in the male, the disco-cellular markings shewing through. *Forewing* with the discal macular band as in the male but white, and the four anterior spots larger, all the spots outwardly sharply defined by a fine line of the ground-colour; beyond the macular band is a broad whitish fascia from near the costa to the inner margin, bearing an increasing series of six black spots, the spot in the submedian interspace double. *Hindwing* has the spots of the discal band smaller than in the male, diamond-shaped, well-separated, outwardly sharply defined as in the forewing, pure white; the broad whitish discal fascia beyond bearing a series of prominent black lunules. UNDERSIDE, *both wings* as in the male.

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* *Vide* Proceedings A. S. B, 1892, p 144.

The male of *E. eion* may be known from the same sex of *E teuta*, Doubleday and Hewitson, which appears to be confined to Assam and Northern Burma, by the subapical spot of the forewing on the upperside being smaller, and by the presence of the submarginal series of seven decreasing white spots on the hindwing. The female is at once distinguished by the broad whitish fascia across both wings on the upperside beyond the discal macular band, also by the spots of the latter being smaller and well separated. *E. teuta* has been recorded by Mr. Moore from Java and by Mr. Druce from Borneo. It is doubtful if it occurs in either island, the Javan species being *E. eion*, and the Bornean *E bellata*, Druce.

Described from two males and two females in my collection, received from Mr. H Fruhstorfer, and one male in the collection of Herr George Semper, taken in February.

11. EUTHALIA (*Dophla*) ESON, n. sp., Plate I, Figs. 3, ♂, 5, ♀.

Euthalia cenespolis, Staudinger (*nec* Hewitson), Iris, vol. ii, p 73 (1889).

HABITAT: Palawan, Philippine Isles

EXPANSE ♂, 3 1, ♀, 3 7 inches

DESCRIPTION · MALE. UPPERSIDE, *both wings* pale clear brown, all the veins fuscous and prominent. *Forewing* with a small dark round spot in the middle of the discoidal cell touching the subcostal nervure, two fine black lines on either side of the disco-cellular nervules, a discal series of eight semi-transparent pale yellow spots, each spot outwardly bounded by a fuscous line, which line is inwardly lengthened out into a point, the three anterior spots lengthened, the fourth and fifth in the median interspaces pyriform, the apex of each spot directed towards the base of the wing, two small spots in the submedian interspace, a minute one in the sutural area, beyond this series of spots is a pale fascia, prominent at the inner margin, becoming lost anteriorly at a small pale yellow spot in the subcostal interspace; this pale band is outwardly defined by a highly lunulated fuscous line, anteriorly becoming obsolete. *Hindwing* bearing a discal series of eight spots, the three anterior ones white, the others pale yellow, these five latter are each outwardly defined by a fuscous line, the uppermost spot on the costa narrow, elongated, the second spot the largest, rounded, the third a little smaller, oval, the next four small, equal-sized, the eighth posterior spot the smallest; a submarginal series of seven sagittate fuscous markings, the apex of each directed inwardly, and each bearing outwardly a pale spot placed against it between the points of the forks. UNDERSIDE, *both wings* pale ochreous-brown washed with pale violet, the discal macular band of the upperside almost obliterated. *Forewing* with the markings in the discoidal cell as on the upperside, but much more prominent; an increasing submarginal series of black spots *Hindwing* with a pair of fuscous lines defining the disco-cellular nervules, a submarginal series of eight linear black spots between the veins, the two posterior ones in the submedian interspace geminated. FEMALE, much paler than the male throughout, but very similarly marked *Forewing* with all the spots of the discal series very much larger and pure white, the two uppermost spots greatly lengthened. *Hindwing* with all the spots of the discal series white, of nearly the same size as in the male. UNDERSIDE, *both wings* paler even than in the male, of a more ochreous shade, the markings similar

This is a very distinct species and quite easily separable from all those that I have placed before it in the key. The ground-colour of the male on the upperside is quite feminine, being much paler than in any other species of this sub-group of *Euthalia.* The discal series of spots on the hindwing will separate it from all the other species except *E. externa,* de Nicéville, next described, owing to each spot standing alone, and the five posterior ones being outwardly defined by a black ring, from *E externa* it may be known by its generally paler colour, and the discal series of spots on the forewing being smaller and more regular The female is quite unique, being the only species in the sub-group with the discal series of spots of the forewing regularly increasing in width towards the costa, the uppermost spot being extremely wide. The female of *E eson* greatly reminds one of the same sex of *E.* (*Tanaecia*) *pulasara,* Moore.

Described from a single pair of specimens in Herr Georg Semper's collection, to whom I am greatly indebted for the loan of his entire series of this sub-group of *Euthalia.* These specimens of *E. esôn* are from those collected by Dr. Platen, who obtained ten males and eight females.

12. EUTHALIA (*Dophla*) EXTERNA, n. sp, Plate II, Fig. 1, ♂, 2, ♀.

HABITAT Nias Island.

EXPANSE: ♂, 2·8, ♀, 3·3 inches.

DESCRIPTION: MALE. UPPERSIDE, *both wings* shining fuscous, outwardly paler. *Forewing* with the usual black spot in the middle and pair of lines closing the discoidal cell, a discal irregular series of seven pale primrose-coloured spots, outwardly (owing to the ground-colour at this point being paler than the rest of the wing) defined rather broadly with fuscous, the anterior spot obsolete, a thin blurred line only, the second and third spots also linear but of a good breadth, the fourth and fifth spots in the median interspaces somewhat irregular ovals, the fifth the largest in the series, the sixth spot constricted in the middle, almost bisected, the seventh spot small and oval, a well marked submarginal black fascia formed of regular lunules, anteriorly becoming smaller and lost altogether in the subcostal interspace, which bears between the discal series of spots and the submarginal lunular fascia a small round yellow spot. *Hindwing* with a prominent discal series of eight spots, the three anterior ones white, the five posterior ones pale primrose-coloured, these latter outwardly defined by a broad black line, the uppermost spot on the costa linear, the second the largest, the third next in size, the sixth the smallest, the fourth, fifth and seventh equal-sized, a prominent highly-lunulated submarginal black fascia placed on a pale ground, the two anteriormost portions of this band quadrate, bearing each a whitish spot on either side UNDERSIDE, *both wings* ochreous, more or less washed with purplish, a submarginal series of small round black spots between the veins. *Forewing* with the ring-spot in the middle and double line closing the cell very prominent, the discal band white, obscure, each spot forming it outwardly defined by a thin dark line. *Hindwing* with a prominent small black ring-spot in the middle of the cell (this spot is absent in *E eson*, de Nicéville, and *E gupta*, de Nicéville, but is present in all the other species), two prominent black lines at the end of the cell, the spots forming the discal band much larger than on the upperside, all touching, and outwardly defined with a thin dark line. FEMALE. UPPERSIDE, *both wings* somewhat paler than in the male. *Forewing* similarly marked, but the spots of the discal band larger and pure white, as is also the subcostal spot, a prominent violet-white fascia between the discal and submarginal bands, extending from the inner margin to the lower discoidal nervule *Hindwing* with the discal macular band of the male reduced to five spots only, all the spots very much smaller also, no spots posterior to the third median nervule. UNDERSIDE, *both wings* richer coloured than in the male, strongly tinted with ferruginous, the submarginal black spots all larger and more diffused *Forewing* with the discal white band anteriorly much expanded *Hindwing* with a well-formed prominent discal macular white band, extending from the costa to the abdominal margin, the spots posterior to the first median nervule run into a single spot undivided by the crossing veins

The male of *E. externa* is nearest to the same sex of *E. eson*, de Nicéville; I have pointed out above how they differ. The female of *E. externa* is nearest to *E goodrichi*, Distant, from Perak, from which it may be known by the spots of the discal series of the forewing on the upperside being three times as large, greatly reducing thereby the pale area between these spots and the submarginal band; on the hindwing above there are two spots less than in *E. goodrichi*, the submarginal lunulated black band is also much broader than in that species.

Described from a single pair of specimens in the collection of Herr Georg Semper.

13. EUTHALIA (*Dophla*) EURUS, n sp, Plate II, Figs. 3, ♂; 4, ♀.

HABITAT N.-E. Sumatra.

EXPANSE ♂, 2·7; ♀, 3·3 inches.

DESCRIPTION MALE UPPERSIDE, *both wings* shining fuscous, paler externally. *Forewing* with a discal macular very pale green band consisting of seven spots, the uppermost spot of all out of line, placed nearer the base of the wing than those which follow it, the three uppermost spots small and linear, the fourth spot larger, rounded, the fifth spot larger than the fourth, also rounded, the sixth spot the largest of all, outwardly strongly cleft, the seventh spot on the inner margin small and quadrate, the usual subapical pale green dot in the subcostal interspace, an indistinct increasing submarginal macular black fascia. *Hindwing* with a conjoined macular discal very pale green band consisting of eight spots, the three uppermost spots, however, are white, the inner edge of the fascia straight and even, the outer edge saw-like, as each spot is produced into a point, a submarginal lunular black fascia, each lunule of which the fascia is composed bearing outwardly a whitish spot, the three uppermost of these increasingly prominent. UNDERSIDE, *both wings* greenish-ochreous, washed with violet, the discal macular band much as on the upperside, the submarginal fascia reduced to small linear black spots between the veins. *Forewing* with a black ring-spot in the middle, and a double lunular spot closing the discoidal cell, both filled in with crimson. *Hindwing* with a black dot in the middle and a double black line closing the cell, the latter faintly tinged with crimson in the middle. FEMALE UPPERSIDE, *both wings* shining brownish-ochreous, the disc powdered with pale violet-white which merges again into the dark outer margin. *Forewing* with the markings on the underside in the discoidal cell shewing through, the discal series of spots increased to eight, white, each spot outwardly defined by a brown line, the three anterior spots linear, large, the fourth and fifth of equal size, the sixth and seventh in the submedian interspace well separated, the eighth on the inner margin oval, the subapical spot much larger than in the male, a submarginal series of six black spots placed between the veins. *Hindwing* with the discal macular band as in the forewing, but consisting of seven spots only, the series ending posteriorly in the first median interspace; the uppermost spot on the costa linear, the second spot the largest of all, the rest decreasingly smaller; a prominent highly zig-zag submarginal black line. UNDERSIDE, *both wings* paler than on the upperside, the markings very similar, those in the discoidal cell as in the male.

The male of this species, as in the rest of the group, except *E recta*, de Nicéville, is barely distinct from its allies, it is, however, nearest to *E. eson*, de Nicéville, from Java, described above. The female is nearest to *E bellata*, Druce, from Borneo, of which latter I possess a specimen for comparison, from which it differs in the broad pale violet-powdered discal area, especially marked in the hindwing Mr. Hewitson's figure of the female of *E. bellata*, in 'Exotic Butterflies,' vol v, *Adolias* pl. iv, fig. 14 (1875), where it appears as *E. cenespolis*, does not quite agree with my specimen, his figure shewing a very large powdery-violet area in the forewing extending within the discal band, this area being very faint in my example, and confined to the region beyond the discal band. My female of *E. eurus* differs, however, markedly from Hewitson's figure of *E cenespolis*, and my example also from Borneo, in having a broad discal powdery-violet area to the hindwing on the upperside.

Described from two males and a female example in Dr Martin's, and two males in my own collection, all from N.-E. Sumatra.

The four last butterflies described above belong to a small but well-marked group of the large genus *Euthalia*, and appear to come into the subgenus *Dophla*, Moore, of which *E evelina*, Stoll, is the type. All the species of *Dophla*, as I understand the subgenus, are remarkable in having on the underside of both wings a black ring-spot in the discoidal cell, and a pair of black lines on either side of the disco-cellular nervules centred with crimson. The ring-spot is absent however in two species, *E eson*, de Nicéville, and *E. gupta*, de Nicéville, in the hindwing only. In the *E. evelina* group there are sometimes other crimson markings in the hindwing anterior to the discoidal cell. In all the species of *Dophla* the discoidal cell is closed in both wings by a very slender almost aborted veinlet, and the subcostal nervules of the forewing never anastomose. The outline of the wings is distinctive, the outer margin being highly emarginate in the forewing, giving that wing a more or less falcate appearance. The cilia are very short, and the butterflies give one the idea of having been neatly trimmed round the edges with a pair of scissors. To facilitate reference to the subgroup to which the four species above described belong, I give a key to the known species. The males of several of them are so closely allied that they are almost indistinguishable, the one from the other; but the females are in all cases abundantly distinct, so I have based the key mainly on that sex.

Key to certain species of the subgenus Dophla *allied to* E teuta, *Doubleday and Hewitson.*

A. Male and female, upperside, forewing with the discal macular band straight.

(1) E (*Dophla*) RECTA, Khasia Hills, Burma, Goping, Perak, Malay Peninsula (*coll. Semper*)

B. Male and female, upperside, forewing with the discal macular band curved, the anterior spot out of line, placed nearer the base of the wing than the rest

a. Female, upperside, with the discal macular band extending from the costa of the forewing to the abdominal margin of the hindwing

a^1 Female, upperside, both wings with a prominent white fascia exterior to the discal macular band.

(2) E (*Dophla*) EION, Java

b^1. Female, upperside, both wings with no prominent white fascia exterior to the discal macular band

a^2 Female, upperside, forewing, the two anterior spots of the discal macular band small, smaller than the third spot

a^3. Female, upperside, both wings with the submarginal black fascia highly lunulated

(3) E. (*Dophla*) TEUTA, Assam, Arracan Hills; [Java, *Moore*; Borneo, *Druce*]

b^3. Female, upperside, both wings with the submarginal black fascia composed of quadrate spots, forming a broad fascia with straight edges

(4) E. (*Dophla*) PIRATICA, Luzon, Mindoro, Camiguin de Mindanao, Nord-Mindanao, Philippine Isles

b^2. Female, upperside, forewing, the two anterior spots of the discal macular band very large, larger than the third spot

(5) E (*Dophla*) TEUTOIDES, South Andaman Isles.

b. Female, upperside, with the discal macular band extending from the costa of the forewing to the submedian nervure of the hindwing

(6.) E (*Dophla*) ESON, Palawan, Philippine Isles

c Female, upperside, with the discal macular band extending from the costa of the forewing to the third median nervule of the hindwing

a^1. Female, upperside, forewing with a prominent violet-white fascia between the discal and submarginal bands, extending from the inner margin to the lower discoidal nervule; the discal spots very large

(7) E. (*Dophla*) EXTERNA, Nias Island

b^1. Female, upperside, forewing with no prominent violet-white fascia between the discal and submarginal bands; the discal spots small.

(8) E (*Dophla*) GOODRICHI, Perak *

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* Mr Distant first described this species from Perak in the Malay Peninsula as *Euthalia goodrichi*, but subsequently sank that name in his 'Rhopalocera Malayana,' p 436, n 17, as a synonym of *E. bellata*, Druce, equals *Adolias cenespolis*,

d. Female, upperside, with the discal macular band extending from the costa of the forewing to the first median nervule of the hindwing.

a^1. Hindwing with a prominent powdery-violet fascia between the discal macular band and the lunulated submarginal line.

(9) E. (*Dophla*) EURUS, N.-E. Sumatra.

b^1. Hindwing with no prominent powdery-violet fascia between the discal macular band and the lunulated submarginal line.

(10) E. (*Dophla*) BELLATA, Borneo

e Female, upperside, hindwing with no discal macular band; the spots of the forewing small.

(11) E. (*Dophla*) GUPTA, Burma, Plate II, Fig 5, ♀.

14. CYRESTIS THERESÆ, n sp., Plate V, Fig 8, ♂.

HABITAT Selesseh, N.-E. Sumatra, Borneo

EXPANSE ♂, 1 9 inches.

DESCRIPTION MALE UPPERSIDE, *both wings* rich fulvous *Forewing* with the following black markings —A short straight line at the extreme base of the wing, a second line oblique but straight, from the costa to the submedian nervure, a third line straight from the subcostal nervure to the inner margin, a fourth line much bowed outwardly, confined to the discoidal cell; a fifth line short, straight, also confined to the cell immediately within the disco-cellular nervules, and touching the fourth, a sixth line also straight, a little beyond those veins, commencing on the subcostal nervure, and ending close to the base of the second median nervule, a seventh line angled, commencing at the costa and ending on the inner margin, the angulation being at the point where it crosses the second median nervule, the angle directed outwards, an eighth line broad, almost straight, slightly outwardly curved only, reaching from the costa to the inner margin, a ninth line narrower than the eighth, slightly sinuous, posteriorly zig-zaged, of a deep black colour, from the costa to the inner margin, a tenth line straight, extending from the costa to the first median nervule, with two prominent small round black spots in continuation in the submedian interspace, an eleventh line very narrow and straight, from the costa to the first median nervule, a twelfth line broad, paler, of similar position to the eleventh, a thirteenth line narrow, deep black, close to the outer

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Hewitson, both the latter described from Borneo As in the female of *E goodrichi* the discal band of the hindwing on the upperside ends at the third median nervule, while in *E bellata* it ends at the first, and in the latter all the spots of the hindwing are much larger, besides other minor differences, I think the two species may be kept distinct, and the name *E. goodrichi* revived I possess one female of the Bornean species, and have access to three pairs of the Perak species in Semper's, Adams', and my own collection.

margin; the outer margin itself narrowly fuscous. *Hindwing* with an indistinct sub-basal black line, a second line from the costa losing itself in the abdominal region, the third and fourth lines exceedingly fine, on either side of the disco-cellular nervules, the fifth line from the costa ending in the abdominal region; the sixth line answering to the eighth line in the forewing, and like it fuscous, not deep black, extends from the costa, and runs into the ninth line in the first median interspace; the seventh line narrow, jet-black, from the costa to the first median nervule, the eighth line, composed of six detached portions, commences posterior to the first subcostal nervule and ends at the first median nervule; the ninth line extremely narrow and deep black, from the costa to the first median nervule, the tenth line broad, rather diffused, fuscous, submarginal; the eleventh line fine, deep black, following the margin, the outer margin itself narrowly fuscous the usual large rounded clump of confused bluish and black markings at the anal angle anterior to the large anal lobe, a small round black spot encircled with whitish anterior to this clump, placed just within the second angle made by the abdominal margin, the anal lobe rich fulvous centred with a black spot. UNDERSIDE, *both wings* much paler than on the upperside, the markings very similar but usually paler. *Forewing* with a quadrate whitish patch on the inner margin between the eighth and ninth lines. *Hindwing*, anal lobe with the central black spot much larger than on the upperside

C theresæ is an abundantly distinct species, and comes into the group containing *C thyonneus*, Cramer, which I possess from Celebes, *C tabula*, de Nicéville, from Great Nicobar Island, and *C lutea*, Zinken-Sommer, which is common in Java. In size it agrees with *C. lutea.* In the coloration of the ground of the upperside it is nearest to *C. tabula*, but is rather lighter, it is much darker than *C lutea*, lighter than *C thyonneus.* The tail to the hindwing is less than half as long as in either of the above-mentioned species. In markings it agrees best with *C. thyonneus*, but differs in many details, as, for instance, the seventh and ninth lines on the hindwing in that species are dark metallic steel-blue, in *C. theresæ* they are black without any metallic lustre.

Described from an unique specimen in Dr L. Martin's collection, taken in the virgin forest of Selesseh, on the 21st May, 1893; also from another example from Borneo given to me by Dr Martin. At his suggestion I name the species after H R. H. the Princess Therese of Bavaria, daughter of the Prince Regent, who is a student and lover of Natural History

Family LEMONIIDÆ.

Subfamily NEMEOBIINÆ.

15. **LAXITA LAOCOON**, n. sp., Plate II, Fig. 6, ♀.

HABITAT: Malay Peninsula.

EXPANSE: ♀, 1·65 and 1·80 inches.

DESCRIPTION. FEMALE. UPPERSIDE, *forewing* with the apical two-thirds of the surface crimson, the costa and outer margin very narrowly, the discoidal cell not quite to its end, a small spot in the second median, and a much larger space in the first median, and almost the whole of the submedian interspace, fuscous. *Hindwing*, shining fuscous, almost bronzy in some lights, the veins slightly touched with crimson, an indistinct marginal crimson line. UNDERSIDE, *both wings* marked as in *L. damajanti*, Felder.

Very near to *L. damajanti*, Felder, of which I possess six males and seven females from Perak, and five males and two females from N.-E. Sumatra, differing on the upperside in the crimson coloration being practically confined to the apical two-thirds of the forewing instead of occupying almost the entire surface of both wings.

Described from two examples from Perak, and one from Rawan in Selangor, both in the Malay Peninsula.

16. LAXITA LOLA, n. sp., Plate II, Figs. 9, ♂, 7, ♀.

HABITAT: S.-E. Borneo.

EXPANSE: ♂, 2·0 and 2·2; ♀, 2·1 inches.

DESCRIPTION. MALE. UPPERSIDE, *forewing* with the costa as far as the subcostal nervure and the outer margin narrowly, fuscous, the apical two-thirds of the wing crimson, the disco-cellular nervules marked by a fuscous line; the posterior half of the discoidal cell, three streaks beyond the cell in the two discoidal and upper median interspaces, a larger space in the lower median interspace, and the entire area between the first median nervule and the inner margin, fuscous. *Hindwing* with that portion of the costal area covered by the bowed-out inner margin of the forewing pale shining fuscous, bearing the usual oval ochreous flour-like "male-mark," the rest of the wing fuscous, the outer margin bearing an indistinct crimson line. UNDERSIDE, *both wings* differ from *L. damajanti*, Felder, in all the brilliant metallic blue markings being much reduced in size, the submarginal series in *L. lola*, in the *forewing*, has almost entirely disappeared, the crimson area at the apex appearing thus to be of considerably greater extent, otherwise as in that species. FEMALE. UPPERSIDE, *forewing* with the crimson area of the same extent as in the male, but of a paler shade, bearing on the disc from the third median nervule increasing to the costa a pale buff fascia. *Hindwing* paler than in the male, the veins streaked more or less with crimson. UNDERSIDE, *both wings* coloured and marked much as in the male, but the crimson ground-colour paler.

The male of *L. lola* may at once be known from the same sex of *L. damajanti* by the presence of the fuscous areas on the upperside of both wings, the latter being "rubris, supra immaculatis," the female may be known from that sex of *L. laocoon*, mihi, by the pale buff fascia on the upperside of the forewing.

Described from two males and one female in my collection.

17. LAXITA LYCLENE, n. sp., Plate II, Fig. 10, ♂.

Abisara telesia, Distant (*nec* Hewitson), Rhop. Malay., p. 449, n. 8, pl. xl, figs. 2, *male*, 3, *female* (1886), *Taxila telesia*, Staudinger, Ex. Schmett., p. 239, pl. lxxxvii, *male* (1887).

HABITAT. Malay Peninsula; N.-E. Sumatra.

EXPANSE. ♂, 1·75 to 1·90, ♀, 1·80 to 1·90 inches.

DESCRIPTION. MALE. UPPERSIDE, *both wings* fuscous. *Forewing* with the apex broadly, decreasing to the anal angle where it ends in a point, crimson, crossed by the black veins, an oval milky-white spot placed obliquely outwards across the middle of the submedian interspace, anteriorly extending slightly into the first median interspace. *Hindwing* with the costa at the base as usual broadly pale or whitish, bearing an oval flour-like ochreous "male-mark," the apex narrowly crimson. UNDERSIDE, *forewing* differs from the same sex of true *L. telesia*, Hewitson, from Borneo, in having the chrome-yellow (Hewitson calls it "rufous") apical area much reduced or obsolete, the two submarginal chrome-yellow lunules in the median interspaces in *L. telesia* replaced by metallic blue lunules, and in having the discal series of metallic blue spots increased from two to five or six, there being three or four extra ones in the discoidal and subcostal interspaces. *Hindwing* does not differ from that of *L. telesia*. FEMALE. UPPERSIDE, *both wings* as in *L. telesia*. UNDERSIDE, *both wings* as in *L. telesia*.

The male of *L. lyclene* may at once be known by the crimson apical area on the upperside of the forewing being much larger than in *L. telesia*, and as regards the hindwing in having the apex touched with crimson. The females of the two species appear to be quite indistinguishable.

Described from one male from Rawan in Selangore, and three males and two females from Perak, both in the Malay Peninsula, and numerous specimens from N.-E. Sumatra. True *L. telesia* occurs in

Borneo, the type being from Sarawak, and in my collection are three males and a female from S.-E. Borneo. Mr. Distant records *L. telesia* from Sumatra, but this species is probably the one meant.

18 LAXITA LYNCESTIS, n. sp., Plate II, Fig. 8, ♂.

HABITAT: Malay Peninsula.

EXPANSE ♂, 1·7 inches.

DESCRIPTION: MALE UPPERSIDE, *both wings* and *cilia* fuscous. *Forewing* with a band of crimson on the outer margin, wide on the costa, fining away to nothing at the anal angle, a broad oblique discal bluish-white band, commencing anteriorly just anterior to the lower discoidal nervule, ending just before the anal angle on the submedian nervure, notched inwardly at the origin of the second median nervule, anteriorly inwardly bounded by the disco-cellular nervules *Hindwing* with the usual shining pale fuscous costal area bearing the "male-mark" of the genus. UNDERSIDE, *forewing* differs from *L. orphna*, Boisduval, in having numerous metallic blue markings on the disc, in the present species there are two such spots placed outwardly against the two inner black spots in the median interspaces, and three such spots placed outwardly against the three black spots beyond the outer end of the cell, with a series of five others beyond extending across the disc, in *L. orphna* all these blue spots are lacking *Hindwing* as in *L orphna* *

This species is not included in Mr. Distant's "Rhopalocera Malayana." On the upperside it differs from two male specimens of *L orphna* in my collection from S.-E. Borneo in its smaller size, brighter crimson outer border to the forewing on the upperside, and narrower discal bluish-white band, which latter in *L. orphna* is not inwardly notched below the cell.

Described from a single specimen in my collection from Perak.

There is one species of *Laxita* which I am still unable to identify This is the butterfly figured by Hewitson in "The Genera of Diurnal Lipidoptera," vol. ii, p. 422, n 7, pl lxix, figs. 7, *male*, 6, *female* (1851), as "*Emesis orphna*, Boisduval," but re-named "*Taxila*" *tanita*, by Hewitson, in his "Exotic Butterflies," vol. ii, *Taxila* pl i, text (1861). Mr. Distant in his "Rhopalocera Malayana," p. 192, n. 5, pl. xviii, fig 14, *female* (1883), describes and figures an "*Abisara*" *tanita*. This female specimen does not at all agree with Hewitson's figure of the female. It appears to me probable that Hewitson's male figure and Distant's female figure refer to one species, which might stand as *L. tanita*, the locality for which, as given in "The Genera," p. 422, n. 7, is "Borneo; India," but requires to be verified. I have seen no specimens agreeing with these two figures, Hewitson's n. 7, *male*, and Distant's *female*; the species if distinct is very near to *L. damajanti*, Felder. The species represented in Hewitson's fig. n. 6, *female*, should, it appears to me, if re-discovered, be named. It is apparently nearest to *L. telesia*, Hewitson, but has the chrome-yellow area at the apex of the forewing on the upperside much larger than in that species. Mr. Distant has further complicated matters by describing Hewitson's female figure n. 6 as a male. The bowed-out inner margin of the forewing in the males of the genus *Laxita* will at once distinguish them from the females, which have the inner margin straight. The species which Dr. Staudinger figures as "*Taxila*" *tanita*, Hewitson, in his "Exotische Schmetterlinge," p. 239, pl. lxxxvii, *male* (1887), appears not to differ from what I identify as *L. damajanti*.

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* The differences pointed out above on the underside of the forewing will be at once observed by comparing the original figure of *L. orphna* in Boisduval's "Species Général," vol. i, pl. xxi, fig. 4, *female* (1836), with my figure of *L. lyncestis*.

Family LYCÆNIDÆ.

19. GERYDUS GIGANTES, n. sp., Plate V, Figs. 1, ♂; 13, ♀.

HABITAT. Penang, Battak Mountains, N.-E. Sumatra.

EXPANSE. ♂, 2·0, ♀, 1·8 to 2·1 inches.

DESCRIPTION. MALE. UPPERSIDE, *both wings* pure chalky-white. *Forewing* with the basal third of the costa reaching to the subcostal nervure dusky, the costa beyond this, the apex and the outer margin broadly black, the inner edge of this large black area very irregular, it just enters the anterior outer angle of the discoidal cell, is pointed inwardly on the second median nervule, closely approaches the outer margin (exactly as in typical *Terias hecabe*, Linnæus) in the first median and submedian interspaces, the black area is wider again from the submedian fold to the inner margin, a small portion of the base of the third median nervule prominently swollen, this being a characteristic secondary sexual character in this genus. *Hindwing* with the costa outwardly broadly black. *Cilia* of both wings fuscous. UNDERSIDE, *forewing* black, the disc crossed by a pure white oblique macular band formed of four portions; two small and obscure ring-spots in the cell, one on the costa about two-thirds from the base of the wing, the apex and outer margin decreasingly pale ferruginous, the inner edge of this area bearing anteriorly a series of four whitish ring-spots, a submarginal series of black dots between the veins; a rather large oblong dark spot placed obliquely at the anal angle. *Hindwing* pale ferruginous; bearing regularly over the surface darker red spots arranged much as in typical species of the genus *Arhopala*, Boisduval, these spots are disposed thus —A small round one at the extreme base of the wing, followed by a series of three single spots, then another series of three, but these spots are double, then four conjoined spots at the extremity of the cell, then a discal curved band extending across the wing from the costa to the abdominal margin, broken only by the first subcostal nervule, some obscure spots on the outer margin FEMALE UPPERSIDE, *both wings* marked almost exactly as in the male UNDERSIDE, *forewing* differs from the male in having the discal macular band more extensive and run together into a single undivided band, anteriorly bounded by the subcostal nervure, posteriorly by the inner margin, along which it extends to the base of the wing. *Hindwing* with the macular markings less conspicuous than in the male; the inner edge of the discal series of spots bears on the posterior half of its length a series of black spots often found in the species of this genus

G. gigantes is not only the largest known, but is the most conspicuously-marked species in the genus, and has no near ally. Were the ground-colour of the upperside yellow, instead of pure white, it would almost exactly resemble *Terias hecabe*.

I have described the species from a male and two females in Dr. Martin's and my collection, taken in the Battak Mountains of N -E Sumatra, in August and November, and another pair in Mr. A. R Adams' collection taken at Penang.

20. GERYDUS GÆTULUS, n. sp, Plate V, Fig. 12, ♀.

HABITAT Battak Mountains, N.-E. Sumatra.

EXPANSE ♀, 1·3 and 1·5 inches.

DESCRIPTION· FEMALE UPPERSIDE, *forewing* pure white; the costa basally, and the base of the wing, dusky, the apex very broadly black, as is also the outer margin at the anal angle, but much more narrowly so *Hindwing* with the disc only white, the rest of the wing dusky, the disco-cellular nervules marked by a prominent blackish line. UNDERSIDE, *forewing* with the disc white, the rest of the wing pale slate-colour; three increasing dark spots outlined outwardly with white in the discoidal cell, a dark spot posterior to the middle one of these in the submedian interspace, three ring-spots on the costa; a short subapical macular band ending posteriorly in a separated round spot in the second median interspace, an oblique prominent spot at the anal angle; a submarginal series of black dots between the veins. *Hindwing*, pale slate-colour, with the macular markings as usual in the genus.

Nearest apparently to *G. zinckenii*, Felder, from Java, of which

I have a good series, but it may at once be known from that species on the upperside by the hindwing being white on the disc with a prominent dark disco-cellular line, *G. zinckenii* being dusky throughout, on the underside the ground-colour is a pale slate-colour, in *G. zinckenii* it is pale ferruginous.

Described from two specimens, one in Dr. Martin's and one in my collection, taken in the Battak Mountains in October, 1892.

21. Gerydus gallus, n. sp., Plate V, Fig. 11, ♀.

Habitat: Battak Mountains, N.-E. Sumatra.

Expanse: ♀, 1·5 inches.

Description Female. Upperside, *both wings* fuscous. *Forewing* with the apical area darker than the basal, crossed by an oblique discal white band with highly irregular edges, not quite reaching the costa or the outer margin above the anal angle, ending posteriorly on the submedian fold. *Cilia* fuscous. *Hindwing* immaculate. *Cilia* anteriorly white, becoming fuscous towards the anal angle. Underside, *both wings* highly variegated, being coloured black, white, pale ochreous, and ferruginous *Forewing* with the ground-colour black, the discal white band as above but broader, its edges even, reaching the outer margin at the anal angle; a pale ochreous patch at the apex, below which the ground-colour is ferruginous, three white ring-spots on the costa; two similar ones in the discoidal cell, a prominent black spot at the anal angle; a submarginal macular black line. *Hindwing* with the anterior half pale ochreous, the posterior fuscous mottled with ochreous, the macular markings as usual, though somewhat indistinct.

This may be a highly variegated form of *G symethus*, Cramer, a common species in N.-E. Sumatra, but it differs greatly from any specimen of that species in my large suite of examples from the Malay Peninsula, Sumatra, Borneo, and Java, from all of which *G. gallus* differs in the white band on the upperside of the forewing being half as wide. the hindwing concolorous throughout, and by the highly variegated markings of the underside.

Described from a single example in Dr. L. Martin's collection.

As the genus *Gerydus*, Boisduval, has vastly increased in numbers in recent years, it may perhaps be useful to add a list of the described species, as far as I know them. Many species described in this genus do not belong to it at all, and have been excluded The flattened legs of all the species is an unique character by which they may be instantly known. The list is headed by the largest, most beautiful, and most aberrant species.

(1) GERYDUS GIGANTES, de Nicéville, Penang, N.-E. Sumatra (*de Nicéville*).

(2) GERYDUS SYMETHUS, Cramer, East Indies (*Cramer*), Moulmein, Penang, Malacca, Perak, Johore, Sumatra, Nias Island, Java, Borneo, Pulo Laut, Palawan, Luzon, Mindanao, Jolo Islands, S.-W. Celebes, Amboina, Sumba, Sambawa, Ceram, Goram, Flores, New Guinea.

Mr. Doherty considers that the *G. pandu*, Horsfield, described from Java, which is generally given as a synonym of this species, may be distinct. I am unable, however, to find any character by which the two species can be separated.

(3) GERYDUS PETRONIUS, Distant, N. Borneo (*Distant*).

(4) GERYDUS TEOS, Doherty, Sumba, Sambawa (*Doherty*).

(5) GERYDUS GALLUS, de Nicéville, N.-E. Sumatra (*de Nicéville*).

(6) GERYDUS BIGGSII, Distant, Malacca (*Distant*), Burma, Perak, Sumatra, Nias Island, Pulo Laut.

(7) GERYDUS GOPARA, de Nicéville, Perak (*de Nicéville*), Johore, Singapore, North Borneo.

This species is placed by Mr. H. J. Elwes and Mr. W Doherty as a synonym of *G. biggsii*, which is probably correct.

(8) GERYDUS DRUCEI, Semper, Bohol in the Philippine Islands (*Semper*).

(9) GERYDUS ZINCKENII, Felder, Java (*Felder*).

(10) GERYDUS GÆTULUS, de Nicéville, N.-E. Sumatra (*de Nicéville*).

(11) GERYDUS CHINENSIS, Felder, Hongkong (*Felder*).

(12) GERYDUS CHINENSIS, var. CERAMENSIS, Ribbe, Celebes, Amboina, Saigun, Buru, Borneo (*Ribbe*).

(13) GERYDUS IRRORATUS, Druce, Siam (*Druce*), Luzon, Palawan

(14) GERYDUS IRRORATUS, var ASSAMENSIS, Doherty, Naga Hills (*Doherty*), Perak, Pulo Laut.

(15) GERYDUS PHILIPPUS, Staudinger, Palawan (*Staudinger*).

This species is placed by Herr Georg Semper as a synonym of *G. irroratus*, Druce.

(16) GERYDUS BOISDUVALI, Moore, Java (*Moore*), Sikkim, Assam, Chittagong Hill Tracts, Burma, Shan States, Singapore, Saigon, Amboina, Batjan, Buru, Ceram, Ké Islands.

(17) GERYDUS BOISDUVALI, var. ACRAGAS, Doherty, Sumba, Sambawa (*Doherty*).

(18) GERYDUS LEARCHUS, Felder, Luzon, China (*Felder*).

(19) GERYDUS STYGIANUS, Butler, Ternate (*Butler*).

(20) GERYDUS MELANION, Felder, Luzon (*Felder*), Cebú, Samar, Bohol, Camotes, Panaon, Camiguin de Mindanao, Mindanao.

(21) GERYDUS CROTON, Doherty, Burma (*Doherty*), East Pegu.

(22) Gerydus maximus, Holland, Celebes (*Holland*).
(23) Gerydus ancon, Doherty, Tavoy (*Doherty*).
(24) Gerydus heracleion, Doherty, Perak (*Doherty*).
(25) ? Gerydus plautus, Fabricius, the Indies (*Fabricius*).
(26) ? Gerydus leos, Guérin, Bouru (*Guérin*).

22. Paragerydus portunus, n. sp., Plate V, Fig. 14, ♂.

Habitat. Java.

Expanse: ♂, 1·5 and 1·6 inches.

Description: Male. Upperside, *both wings* dull hair-brown. *Forewing* with the usual ochreous lines on the costa and pale area on either side of the swollen third median nervule. Underside, *both wings* pale ochreous, profusely and evenly sprinkled throughout with minute ferruginous spots. *Forewing* with the inner margin somewhat paler and free of markings, though bearing two or three striæ larger than the others towards the base of the wing

This species appears to be nearest to *P. taras*, Doherty, which has the apex of the forewing on the underside "rufous-brown," while *P. portunus* has the whole of the underside of that colour, the ground-colour of *P. taras* is white, of *P portunus* pale ochreous. Of *P. taras* I have captured both sexes in the Meplé Valley, middle Tenasserim, in October.

Mr. Doherty, who takes particular interest in this group of the *Lycænidæ*, has recorded his feelings of doubt as to whether the genus *Paragerydus* can be maintained as distinct from the genus *Allotinus*.* As far as the specimens of both genera contained in my collection are concerned, I am of opinion that the two genera may well be kept distinct. The length, and consequently the point of origin, of the third subcostal nervule of the forewing, certainly varies greatly, but in all my examples of *Paragerydus* the upper discoidal nervule originates from the subcostal nervure well beyond the apex of the discoidal cell; while in all my examples of *Allotinus* it originates at the apex, which feature constitutes a well-marked difference, and can be instantly detected by the application of a little benzine to the wing to make it transparent.

P. portunus is described from two specimens sent me by Mr. H. Fruhstorfer.

23. Paragerydus pyxus, n. sp., Plate V, Fig. 2, ♂.

Habitat: Borneo.

Expanse: ♂, 1·4 inches.

Description: Male. Upperside, *both wings* rufous-brown *Forewing* with the lines on the costa and "male-mark" as usual. UNDERSIDE, *both wings* pale rufous, profusely and evenly sprinked with dots and spots of a deeper rufous colour, a marginal series of very small black spots, one in each interspace

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* Journ. A. S. B., vol. lviii, pt. 2, p. 437 (1889)

Closely allied to *P portunus*, mihi, from Java, but differs on the upperside in being rufous-brown, instead of dull hair-brown, and on the underside in having the ground-colour pale rufous instead of pale ochreous, and in the presence of the marginal black dots.

Described from a single example received from the late Mr. W. Davison.

24. LOGANIA LUCA, n sp, Plate II, Fig 13, ♀.

HABITAT · Perak, Malay Peninsula, N.-E. Sumatra.

EXPANSE. ♀, 1·0 inch

DESCRIPTION. FEMALE. UPPERSIDE, *forewing* with the basal half milky-white, the outer half fuscous, the costa and base dusky, the extreme costa dotted with white on the basal half *Hindwing* fuscous, the disc obscurely purplish-white. UNDERSIDE, *both wings* with the ground-colour probably white, but the surface is so thickly irrorated with brownish-ochreous that the ground-colour appears only as minute white dots profusely and evenly scattered over the surface mixed with a few black scales *Forewing* with an obscure darker spot towards the end of the discoidal cell, and a similar discal band. *Hindwing* with some very obscure dark spots towards the base, an oblong one at the end of the cell, and a curved discal band crossing the wing from the costa to the abdominal margin.

Probably nearest to *L. marmorata*, Moore, the two original specimens of which, in very poor condition (probably both females, one certainly is that sex, the body of the other is lost, but the shape of the wings is certainly feminine), are before me. *L. luca* differs from them in having the outer margin of both wings more even, not distinctly scalloped, and the ground-colour of the underside is far redder, with the irrorations much more dense; this latter, however, is a variable feature in *L. marmorata*, as shewn in Mr Moore's and my figures of the species taken from different specimens *L. luca* may be still nearer to *L. obscura*, Distant, but the short original description of the latter does not in several particulars fit my specimens; Semper's and Staudinger's figures of the species agree very well with my specimens on the upperside, but neither of them agree on the underside.

I took two fresh specimens of this species in the high forest at Namoe Oekor, in October, 1893 They were flying amongst and settling on the low bushes growing under the high trees. I also possess two other females from Perak

As far as I am aware, the genus *Logania* contains the following species. I include in it the two species, *L. marmorata*, Moore, and *L. sriwa*, Distant, which constitute Mr. Doherty's genus *Malais*, as he himself doubted subsequently the validity of the genus.* I have arranged the species chronologically.

(1) ? LOGANIA REGINA, Druce, Borneo (*Druce*). This species may be an *Allotinus*. To judge from the figure, the type specimen must have been a male, as the body is very long. Mr Druce does not say what sex he described.

(2) LOGANIA MALAYICA, Distant, Sungei Ujong, in the Malay Peninsula (*Distant*), S.-E Borneo, Pulo Laut, Sibulan, S.-E. Mindanao, one of the Philippine Isles.

(3) ? LOGANIA LAHOMIUS, Khiel, Nias Island (*Khiel*). This species may also be an *Allotinus* The specimen figured seems to be a male, as it has a very long body

(4) LOGANIA MARMORATA, Moore, Elphinstone Island in the Mergui Archipelago (*Moore*); Monè in the Shan States, Perak, N.-E Sumatra, Pulo Laut.

(5) LOGANIA SRIWA, Distant, Malacca (*Distant*), Perak, Pulo Laut

(6) LOGANIA OBSCURA, Distant, Northern Borneo (*Distant*), Palawan, Cebú, and East Mindanao, in the Philippine Isles.

(7) LOGANIA DISTANTI, Semper, Cebú, S -E Mindanao, Philippine Isles (*Semper*).

(8) LOGANIA DISTANTI, Staudinger, Palawan (*Staudinger*) Herr Semper places this species as a synonym of *L obscura*.

(9) LOGANIA MASSALIA, Doherty, Margherita, in Upper Assam (*Doherty*).

(10) LOGANIA LUCA, de Nicéville, N -E. Sumatra (*de Nicéville*).

25. SIMISKINA SOLYMA, n. sp, Plate IV, Fig. 10, ♀.

HABITAT: Gapis, near Taiping, Perak, Malay Peninsula.

EXPANSE: ♀, 1·6 inches.

DESCRIPTION · FEMALE. UPPERSIDE, *both wings* fuscous. *Forewing* with a large oval discal white patch, which, in some lights, is entirely suffused with beautiful rich iridescent emerald-green, and in all lights is more or less bordered by this colour; the patch commences beyond the discoidal cell just anterior to the third median nervule, and reaches the inner margin, its posterior portion, however, is much diffused, just beyond the patch are two rounded emerald-green spots divided by the second median nervule. *Hindwing* with a rather large emerald-green spot in the second median interspace; three lunulated emerald-green lines beyond in the two median and submedian interspaces, a marginal emerald-green thread, broken where it is crossed by the veins, obsolete towards the apex of the wing, the costa of the wing broadly pale ochreous. UNDERSIDE, *both wings* with the basal third chocolate-colour, the outer two-thirds ochreous. *Forewing* with the base of the inner margin ochreous, a broad discal wedge-shaped chocolate-coloured band with its base on the costa, its apex on the submedian nervure; its outer edge closely followed by a narrow chocolate line, the outer margin broadly chocolate. *Hindwing* with a macular, short, but rather broad, chocolate line on the middle of the disc, followed by five large chocolate spots divided only by the veins, the middle one the largest, the one on either side of it smaller, the two outermost spots the smallest, these five spots are followed by a macular band extending right across the wing of somewhat diffused chocolate spots; these again are closely followed by a narrow chocolate line, the margin bears a series of lunular spots between the veins, of which the one in the second median interspace is the largest and black, the rest are black and chocolate; a fine anteciliary inner white and then an outer chocolate thread.

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* Journ. A. S. B, vol. lviii, pt. 2, pp. 415, 436 (1889); vol lx, pt. 2, p. 20 (1891).

This species is quite unique, there is nothing remotely resembling it in the genera *Poritia* or *Simiskina* The white patch on the upperside of the forewing at once reminds one of *Laxita telesia*, Hewitson, which has a similar patch in the male

The type and only known specimen of this species is deposited in the collection of Mr. A. R. Adams of Penang, who caught it himself. I am much indebted to him for allowing me to describe so beautiful and interesting a species.

26. PITHECOPS MARIÆ, n. sp., Plate IV, Figs. 2, ♂; 9, ♀

HABITAT: N.-E. Sumatra.

EXPANSE: ♂, ·8 of an inch to 1·2 inches; ♀, 1·0 inch to 1·1 inches.

DESCRIPTION: MALE. UPPERSIDE, *both wings* rich deep shining blue, almost invisible in some lights. *Forewing* with the apex somewhat widely, the outer margin narrowly and decreasingly black. *Hindwing* with the costa broadly, the outer and abdominal margins less broadly, black. UNDERSIDE, *both wings* milky-white, a series of very fine black dots on the outer margin; an anteciliary black thread. *Forewing* with a very narrow blackish line defining the disco-cellular nervules; two small black dots on the middle of the costa, often absent; a submarginal decreasing ochreous fascia, which becomes dusky at the costa; within which at the anal angle are two fine ochreous lines one above the other. *Hindwing* with a large round black spot at the apex; a submarginal ochreous line. FEMALE. UPPERSIDE, *both wings* dead plumbeous-black. *Forewing* with a short streak of blue scales in the lower discoidal interspace beyond the end of the discoidal cell. *Hindwing* unmarked. UNDERSIDE, *both wings* as in the male. *Cilia* throughout more prominently marked alternately black and white than in the male.

A comparison of the figure here given of the male (which, however, is a very poor one, drawn from a very small specimen, the first I received), with that of *Pithecops fulgens*, Doherty,* from Margherita, in Upper Assam, of which I possess three males and two females, including the type specimens, will at once disclose the fact that on the upperside the male of *P. mariæ* has the blue area of much greater extent (it is also of a deeper, more truly blue, shade), and on the underside, that it is far less heavily marked, the two costal dots of the forewing being often absent, and the apical spot of the hindwing often smaller.

The discovery of a second blue species of the genus is highly interesting. I have described it from several male examples received from Hofrath Dr L. Martin; one taken by myself at Namoe Oekor in October, in the virgin forest, and three female examples in my own collection, and one in Dr. Martin's, after whose amiable wife I have great pleasure in naming it. Though this butterfly is so small, the male immediately attracts attention when flying by the wonderful refulgence of the coloration of the upperside of the wings.

27. CYANIRIS CRISSA, n. sp, Plate II, Fig 12, ♂.

HABITAT: Nilgiri Hills and Ashamboo Hills, South India.

EXPANSE ♂, 1 35 inches.

DESCRIPTION MALE. UPPERSIDE, *both wings* shining violet-blue. *Forewing* with the costa narrowly, the apex widely, the outer margin broadly and evenly, black. *Hindwing* with the costa widely, the outer margin narrowly, black; five round black spots placed against the black border, one each in the discoidal and median, two in the submedian interspace. UNDERSIDE, *both wings* dead white, all the black markings unusually large and prominent; a marginal series of prominent spots, oval in the forewing, round in the hindwing; a submarginal prominent line, broader and lunulated in the forewing, narrower and more highly lunulated in the hindwing; a very fine anteciliary black thread. *Forewing* with a broad prominent comma-shaped mark closing the discoidal cell; a discal series of seven spots, the two anterior and two posterior spots in one straight line, the three middle spots out of line, shifted outwardly. *Hindwing* with three large rounded spots across the base of the wing; a fine line at the end of the cell, a very irregular discal series of eight spots, of which the one on the costa and the one on the abdominal margin are the most prominent. *Cilia* above dusky white, on the underside the cilia under a magnifying glass appear to be white at the base tipped with dusky.

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* Journ. A S. B, vol lviii, pt. 2, p. 127, pl. x, fig. 6, *male* (1889)

C crissa on the upperside agrees best with *C. placida*, de Nicéville, from Sikkim, Assam, Burma, the Malay Peninsula, and Java, but the outer black margin on the forewing is rather broader, and the submarginal black spots on the hindwing are better separated from the black margin On the underside the two species are abundantly distinct, the markings in *C. crissa* being almost throughout deep black, while in *C. placida* they are dull fuscous, they are also far more prominent and larger in *C crissa.* In the rains form of *C puspa*, Horsfield, the markings on the underside are quite as prominent as in *C crissa*, but they differ somewhat in character, in the hindwing especially the submarginal line is much nearer to the marginal spots in *C puspa* than in *C. crissa. C cyanescens*, de Nicéville, from the Nicobar Isles, is another allied species, but the markings on the underside are different, being smaller, less prominent, and more or less fuscous

Described from a single example obtained at Kalar in the Nilgiri Hills by Lieut. E Stokes Roberts, R. E, on the 17th August, 1892, another male taken in March, in the Ashamboo Hills of Travancore, and received from Mr. Harold S. Ferguson.

28. EVERES MOOREI, Leech, Plate II, Fig. 11, ♂.

Lycæna moorei, Leech, Trans. Ent Soc. Lond, 1889, p. 109, n. 45, pl. vii, fig. 3, idem, id, Butt. China, Japan, and Corea, p 310, pl xxxi, fig 9, *male* (1893).

HABITAT: Kiukiang, Chang-yang, Central China (*Leech*); Khasia Hills.

The Rev. Walter A Hamilton has sent me eight specimens of this species obtained by his native collectors in the Khasia Hills. It occurs also at Kiukiang and Chang-yang in Central China. The Indian specimens are a good deal smaller than the Chinese examples (23 as against 29 mms.), but do not differ in coloration and markings. The species is a true *Everes*, as I have ascertained by bleaching the wings of a specimen, but is a little abnormal, as the hindwing has no trace of a tail. This, however, in the *Lycænidæ*, cannot be accepted as a feature of generic or even specific value, as several instances occur in which the same species is both tailed and tailless. In the genus *Everes* not only is *E. moorei* tailless, but the type species, *E. argiades*, Pallas, is sometimes without tails, Mr. W. Doherty having obtained tailless specimens in the Naga Hills, and Lieut. E. Y. Watson similar ones in the North Chin Hills of Upper Burma (Fort White, 7,000 ft., March and April, Tiddim, 5,500 ft., April), of which he has sent me a considerable series. *E. moorei* is not mentioned in Colonel Swinhoe's "List of the Lepidoptera of the Khasia Hills."*

29. LAMPIDES LUCIDE, n. sp., Plate V, Fig. 3, ♂.

HABITAT. Battak Mountains, N.-E. Sumatra.

EXPANSE: ♂, 1·6 inches.

DESCRIPTION. MALE. UPPERSIDE, *both wings* milky-white more or less glossed with pale blue; all the fuscous bands, the dark costa, and base of the wing of the underside shining through as pale blue bands. *Forewing* with the apex broadly, and the outer border rather broadly and decreasingly black. *Hindwing* with a black anteciliary thread, within which is a series of small indistinct linear black lines between the veins; *cilia* white, tipped with black; *tail* black, tipped with white UNDERSIDE, *both wings* chalky-white. *Forewing* with the basal two-thirds of the costa and the base of the wing sprinkled thickly with plumbeous scales; a broad straight fuscous band from the dusky costa to the submedian nervure covering the disco-cellular nervules; a similar but dislocated band beyond from the costa to the third median nervule; between these two bands is a quadrate spot in the second median interspace, a third short band from the costa to the lower discoidal nervule; a fourth band, submarginal, curved, from the costa to the submedian nervure; a fifth marginal narrow band, a rather broad anteciliary black thread. *Hindwing* with the base narrowly thickly sprinkled with plumbeous scales; crossed by seven fuscous bands which are more or less straight till they approach the abdominal area when they are all recurved to the abdominal margin, except the second band from the base of the wing, which ends on the first median nervule and is not recurved; a large oval black spot near the margin in the first median interspace, bearing at the corner nearest to the base of the tail a few brilliant metallic green scales, the spot broadly crowned with rich ferruginous, a small anal black spot bearing anteriorly a few metallic green scales, crowned by a ferruginous line; an anteciliary fine black thread. *Abdomen* plumbeous above, the segments marked with a white line, the abdomen below white.

This is a very remarkable species, and unlike any other. The coloration of the underside is reversed. In the other species of the genus the ground-colour is dark and the markings are white, in *L. lucide* the ground-colour is white and the markings are black. The broad black apex and outer margin of the forewing above, and the markings of the underside of both wings being represented above by pale blue bands, are also quite unique characters. On the upperside *L. lucide* reminds one of *L aratus*, Cramer, as figured by Heer P. C T. Snellen in Tijdsch. voor Ent, vol. xxxiii, p. 271, pl. xi, fig. 1, *male* (1890), from Tanah-Djampea Island, near Celebes, but that species has no broad black border to the forewing.

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* Trans. Ent. Soc. Lond., 1893, p. 297.

Described from one specimen obtained by the Battaks in January, 1893, in my collection, Dr Martin possesses a single female example, which I hope hereafter to have an opportunity to figure and describe

30 **Arhopala constanceæ**, n sp, Plate IV, Fig. 11, ♀.

Habitat South Andaman Isles.

Expanse. ♀, 1·8 inches.

Description. Female. Upperside, *both wings* rich shining rather light blue. *Forewing* with the costa as far as the subcostal nervure, the apex very widely, and the outer margin widely, purplish-black. *Hindwing* with the costa and outer margin broadly purplish-black, the abdominal margin pale fuscous, the anal lobe small, purplish-black, tail rather short, purplish-black tipped with white, *cilia* purplish-black throughout. Underside, *both wings* purplish-reddish-brown, the markings a little darker only than the ground-colour *Forewing* with a small round dot towards the base of the discoidal cell, a larger oval one at its middle, a large one at its end, with a spot below filling the base of the first median interspace, the discal band straight, even, formed of six nearly equal-sized spots, extending from the costa to the first median nervule, two indistinct submarginal macular bands; the inner margin broadly pale, this pale area reaching to the submedian nervure, with an indistinct spot (its outer edge sharply defined) within and posterior to the point where the first median nervule arises. *Hindwing* with the usual basal spots small, the quadrate spot closing the discoidal cell touching the large second anterior spot of the usual discal fascia, the submarginal band broad, the anal lobe bearing a small deep black spot crowned with dull dark green scales, with a few scattered similar scales in the interspace beyond.

There is no allied Indian species with which I can compare this, but it appears to be very similar on the underside to *A. ate*, Hewitson, from Amboina, differing, however, in the discal band of the hindwing touching the disco-cellular spot instead of being widely separated from it, and in having the metallic green sprinklings at the anal angle much fewer.

Described from a single example obtained at Port Blair by the late Mr. R. Wimberley, after whose widow I have much pleasure in naming it.

Genus LISTERIA, nov.

MALE. FOREWING, rather long and narrow; *costa* almost straight, *apex* to termination of third median nervule truncate, *outer margin* below truncation emarginate, *inner angle* rather acute, *inner margin* lobed before the middle; *costal nervure* ending just beyond the upper end of the discoidal cell, *subcostal* nervure with three branches, excluding the terminal portion of the nervure which is often counted as an additional subcostal nervule, terminating on the costa just before the apex of the wing; *first subcostal nervule* arising from the subcostal nervure a little beyond the middle of the cell, ending on the costa beyond the end of the cell, *second* subcostal arising nearer to the apex of the cell than to the origin of the first subcostal, *third* subcostal arising midway between the end of the cell and the apex of the wing, *upper disco-cellular* nervule wanting, *middle* disco-cellular arising at the point where the upper discoidal nervule is given off, concave, *lower* disco-cellular longer than the middle disco-cellular, in the same straight line, concave; *second median* nervule arising well before the lower end of the cell, *first* median arising twice as far from the base of the second as the second does from the end of the cell, *submedian nervure* straight, a sexual *tuft of hairs* attached to the inner margin before its middle and turned under and upwards HINDWING, large, broad, *costa* nearly straight, *outer margin* broadly curved to the anal angle, slightly produced at the termination of the third median nervule, *anal lobe* very large; *abdominal margin* excavated anterior to the anal lobe, *costal nervure* ending at the apex of the wing, very much curved at the base, then straight to the apex, *first subcostal nervule* arising well before the apex of the cell, ending at the apex of the wing, *upper disco-cellular* nervule straight, *lower* disco-cellular also straight, in the same straight line as the upper, both slightly outwardly oblique, a little longer than the upper, *second median* nervule arising just before the lower end of the cell, *submedian nervure* straight, *internal* nervure short, recurved, a sexual *glandular "scale" patch* extending from the base of the first subcostal nervule to the termination of the discoidal cell, not extending into the cell, but with as large or rather larger an area anterior to the first subcostal nervule as there is posterior to that vein. *Antennæ* about half as long as the costa of the forewing, with a large well-formed club *Palpi* rather long, porrect. *Eyes* hairy. *Thorax* rather robust. *Abdomen* short, extending to two-thirds the length of the abdominal margin of the hindwing only. *Cilia* of the hindwing very long and coarse. Type, *L. dudgeonii*, de Nicéville.

The secondary male sexual characters of the genus are nearest as far as Indian genera go to those of *Bindahara*, Moore, the "scale" patch on the hindwing being placed in much the same position, though it is not quite so large and reaches quite up to the origin of the upper disco-cellular nervule, which it does not do in *Bindahara*, and it has a similar tuft of long hairs on the forewing; but it differs from the five Indian genera—*Hysudra*, *Rapala*, *Bindahara*, *Virachola*, and *Sinthusa*, all of Moore—which possess the "scale" mark and tuft of hairs, in being entirely devoid of a tail to the hindwing The genus is so entirely aberrant that it is very difficult to know where to place it, though its affinities are perhaps more with *Thecla*, Fabricius, than with any other.

31. LISTERIA DUDGEONII, n. sp, Plate IV, Fig 3, ♂

HABITAT · Bhutan.

EXPANSE · ♂, 1·25 inches.

DESCRIPTION · MALE. UPPERSIDE, *forewing* black; the discoidal cell, a small area at the base of the second and a larger area at the base of the first median interspace and thence broadly to the inner margin of the wing, but not nearly reaching the anal angle, bright blue. *Hindwing* with the costa broadly extending into the cell, the outer margin broadly but decreasingly to the anal angle, black; the abdominal margin broadly pale fuscous; the rest of the wing bright blue UNDERSIDE, *forewing* pale fuscous inclining to pale ochreous broadly on the inner margin, a large reddish spot at the end of the cell, a discal macular reddish band from the costa to the first median nervule; a submarginal broad black-mixed-with-red band; the sexual tuft of hairs on the inner margin turned under and upwards pale ochreous. *Hindwing* with the base rather broadly black, the rest of the wing reddish, becoming darker towards the outer margin, where it is umber-coloured; beyond the black basal area is a broad area extending across the wing consisting of a confused mass of ill-shaped ochreous spots; the outer margin bears a double lunulated fuscous line, each pair of lunules enclosing a small space of the ground-colour. *Cilia* reddish throughout, broad and coarse, and very long on the hindwing, especially where they fringe the anal lobe.

The butterfly is so entirely different from all others known to me in shape, markings and sexual characters that I can compare it with none. It remotely reminds one of *Thecla frivaldszkyi*, Lederer, and allies, in the markings of the underside; but the coloration of the upperside, the truncated apex of the forewing, and the "male-marks" are wholly dissimilar.

Described from a single example not in very perfect order, captured at 2,500 feet elevation above the sea by Mr. J. L. Lister, after whom I have much pleasure in naming the genus. As my friend Mr. G. C.

Dudgeon "discovered" the species in Mr. Lister's collection, I have named it specifically after him.

32. CAMENA CREMERA, n. sp., Plate V, Fig. 16, ♂.

HABITAT Java.

EXPANSE · ♂, 1·7 inches.

DESCRIPTION · MALE UPPERSIDE, *both wings* cerulean-blue, *cilia* black, faintly tipped with grey on the hindwing. *Forewing* with the costa at the base very narrowly black, but the black area broadening out and reaching the subcostal nervure before the apex of the cell, the apex of the wing very widely black, narrowing away to nothing at the anal angle. *Hindwing* with the costal area broadly pale ochreous, polished; the outer margin narrowly black, but widening out somewhat at the apex of the wing, anal lobe small, inconspicuous, black, with a few turquoise-blue scales posteriorly, obscurely crowned with ochreous, the abdominal margin whitish. UNDERSIDE, *both wings* plumbeous; a common discal even-edged straight white band, widest at the costa of the forewing, ending on that wing at the first median nervule, in the hindwing commencing on the costa, ending on the submarginal dark line; a common submarginal narrow dark line, not quite reaching the costa of either wing, in the forewing slightly outwardly bowed, ending at the submedian nervure, in the hindwing much outwardly bowed, posteriorly zig-zag and recurved to the abdominal margin, defined on the zig-zag portion on both sides by a fine white line; a very fine anteciliary black thread, defined inwardly narrowly with whitish on the hindwing. *Forewing* with the inner margin broadly whitish; the large tuft of hairs turned under and forwards deep black, and lying across a polished area *Hindwing* with a small round black spot in the first median interspace near the margin, anteriorly broadly crowned with a large orange spot which reaches as far as the submarginal dark line; the anal lobe bearing a prominent large round deep black spot, crowned with a thin line of turquoise-blue scales, the area between the anal lobe and the second median nervule broadly sprinkled with grey scales; *tails* black, fringed and tipped with white. *Body* above blue throughout, below whitish.

Closely allied to *C. cotys*, Hewitson, from Nepal, Sikkim, the Khasia Hills, East Pegu, and Burma, and to *C. anysis*, Hewitson, from Macassar (Celebes), and the Philippine and Jolo Isles, differing from the figure of the latter in the black area of the forewing on the upperside being less wide and reaching the inner angle in a regular curve, in *C. anysis* it appears to end abruptly at the first median nervule; in the latter species the apex of the hindwing appears to be blue, in *C. cremera* it is somewhat broadly black; on the underside of the hindwing the black spot in the first median interspace is half as large, while the orange area anterior to this spot is many times larger than in *C. anysis.* From *C. cotys* it differs on the underside in the common white discal band being narrower, in the absence of the common "submarginal obscure rufous band," by the large size of the orange patch crowning the black spot in the first median interspace of the hindwing, and by the anal lobe being crowned with blue instead of orange

Described from two male examples sent me by Mr H. Fruhstorfer.

33. Aphnæus hiendlmayrii, n. sp., Plate V, Fig 5, ♀.

Habitat · N.-E. Sumatra.

Expanse ♀, 1 7 inches

Description · Female. Upperside, *both wings* fuscous with strong reflections in certain lights, in one light dark purple, in another ochreous-bronzy *Hindwing*, anal angle and lobe bearing a large patch of deep red (dragon's blood) colour, this red area outwardly marked with a black line centered with a line of pure silvery scales, *tails* also deep red, but becoming black towards the end, tipped with white Underside, *both wings* dull brownish-ochreous, the disc somewhat mottled with deep red, profusely marked with spots of the purest metallic silvery colour *Forewing* with the silvery spots thus:—A series of dots along the costa, the series not quite reaching the base of the wing, increasing in size as they advance towards the apex of the wing, the series not nearly reaching the apex, a large oblique streak near the middle of the discoidal cell, an upright one across its end, two spots beyond placed obliquely; an elongated curved streak below the cell divided by the second median nervule, a lengthened narrow streak lying along the first median nervule, a chain-like submarginal band—all these silvery spots narrowly outwardly defined with a black line and more broadly by deep red; a marginal deep red line, the base of the wing yellowish, the inner margin broadly whitish, becoming plumbeous at the first median nervule. *Hindwing* with sixteen silvery spots and streaks as in the forewing spread fairly evenly over the base and disc; a submarginal red band recurved to the abdominal margin, the band anteriorly slightly, posteriorly profusely, marked with silvery, a narrow deep red anteciliary line; the anal lobe deep red bearing a small black spot anteriorly crowned with yellow. *Body* above concolorous with the wings on the upperside. *Face* in front, *palpi*, body beneath, and *legs* yellow.

As far as I am aware, this species has no near ally, it does not even remotely resemble any Oriental species with which I am acquainted. In the type specimen, being a female, the upperside is not brilliantly blue coloured as the male will probably prove to be, the rich silvery markings on a ground of an unusual shade, the markings themselves also being of a shape hitherto unknown to me, make the lower surface of this insect not only singularly beautiful but extremely different from all other Eastern species of the genus. It is possibly more nearly related to the numerous richly coloured African species allied to *Aphnæmorpha orcas*, Drury. It is not a little remarkable that while continental India is so rich in species of the genus *Aphnæus*, Sumatra should not possess more than one other species, the wide-spread *A. lohita*, Horsfield, while the Malay Peninsula and larger islands (Borneo and Java) should only possess two or three species, *A. lohita* and *A. syama*, Horsfield, and *A. vulcanus*, Fabricius.

Described from a unique example taken at Selesseh on 15th August, 1893, in Dr L. Martin's collection. At his suggestion I have named it after Herr A. Hiendlmayr, the Custos of the Munich Museum, Bavaria.

34. TAJURIA BLANKA, n. sp., Plate IV, Fig. 4, ♀.

HABITAT: Battak Mountains, N.-E. Sumatra.

EXPANSE: ♀, 1·6 inches.

DESCRIPTION: FEMALE. UPPERSIDE, *forewing* with the costa at the base very narrowly, the apex very widely, the outer margin decreasingly, black; the rest of the wing rather light clear blue. *Hindwing* with the costa broadly fuscous, the apex widely, the outer margin narrowly, black; the abdominal margin as far as the submedian nervure whitish, the rest of the wing blue, the anal lobe small, black, crowned with a few blue scales, the lobe anteriorly bearing against it a white fascia, the tails rather short, black, tipped with white, the longer one from the termination of the first median nervule, the shorter from the submedian nervure. *Cilia* black throughout. UNDERSIDE, *forewing* immaculate, drab, the inner margin extending broadly on to the disc dull ochreous. *Hindwing* drab, with an irregular outer discal dark line outwardly defined by white from the abdominal margin to the third median nervule, a small oval black spot on the margin in the first median interspace, a slightly larger black spot on the anal lobe, anteriorly and posteriorly bearing some fine turquoise-blue scales; the space between and above these spots ochreous, an anteciliary black thread inwardly defined by a narrow white thread from the anal lobe to the third median nervule; *cilia* of the forewing and the anterior moiety of the hindwing drab, the posterior moiety whitish. *Body* above clothed with long hairs, of the shade of blue of the wings; *thorax* beneath drab, *abdomen* beneath dull ochreous.

Probably nearest to *T. mantra*, Felder, and *T. relata*, Distant, from both of which *T. blanka* may instantly be known by the forewing on the underside having no markings whatever.

Described from a single example in Dr. Martin's collection, which was taken in October. Namoe Blanka is the name of a Battak kampong or village.

35. CHARANA CEPHEIS, n. sp., Plate V, Fig. 10, ♂.

HABITAT. Assam.

EXPANSE ♂, 1·8 inches.

DESCRIPTION MALE. UPPERSIDE, *both wings* glossy purplish-black. *Forewing* with the basal two-thirds of the interno-median area ending outwardly in a point and the basal half of the sutural area rich deep blue of about the same shade as in the male of *Camena icetas,* Hewitson *Hindwing* with the outer half from the second subcostal nervule to the submedian nervure, crossed by the black veins, rich deep blue; a diffused and indistinct submarginal black spot in the first median interspace, the outer margin narrowly black, the anal lobe orange-ochreous, bearing a few white and blue scales, the tails black, fringed and tipped with white. UNDERSIDE, *both wings* with the basal two-thirds pale chrome-yellow, the outer third purplish-brown. *Forewing* with the purplish-brown area bearing two macular deeper brown bands, which are farthest apart in the middle but meet at each end, thus enclosing an oval space of the ground-colour; a submarginal whitish thread reaching from the anal angle to the middle of the wing. *Hindwing,* the outer purplish-brown area bears two macular deeper brown bands, the inner one posteriorly highly zig-zag and recurved to the abdominal margin, the outer one reaching only to the second median nervule; the first median interspace bears a round black spot with an outer rust-red ring; the anal lobe is jet-black, anteriorly bearing a few turquoise-blue scales, and bearing anteriorly to these again a rust-red line, which is continued to the abdominal margin along the edge of the incised portion of the wing anterior to the anal lobe, this red line defined on both sides with a very narrow black line. *Cilia* of the hindwing narrowly tipped with white, those of the forewing black.

This species is very near to *C. mandarinus,* Hewitson, from Sikkim, Bhutan, Assam, and Burma, from which it differs in the following particulars.—The blue coloration of the upperside is quite different, being of a much darker and richer hue, in *C mandarinus* it is distinctly "dull cerulean blue," the blue colour also does not extend into the discoidal cell of the forewing as it does in that species; on the underside the outer area of both wings is purplish-brown instead of rufous, in the forewing the macular bands touch at both ends instead of being parallel throughout; and in the hindwing of *C. mandarinus* beyond the inner zig-zag black line from the second median nervule to the abdominal margin there is a considerable white band, this being obsolete in *C. cepheis*, the purplish-brown area being continued uninterruptedly and of equal width throughout from the apex of the wing to the anal angle.

Described from two male specimens exactly alike captured by Lieut. C. H. Ward, on Nemotha, a peak in Cachar, 3,634 feet high, on October 15th, 1892, one of which he has generously presented to me. Lieut. Ward captured *C. mandarinus* at the same time and place.

36. **Neocheritra namoa**, n sp., Plate V, Fig. 9, ♂.

Habitat · Battak Mountains, N.E. Sumatra.

Expanse · ♂, 1 6 inches.

Description · Male. Upperside, *forewing* and *cilia* black; a broad oblique pale non-iridescent blue band crosses the base of the wing, this area commences narrowly on the costa, crosses the discoidal cell at about its middle, meeting the median nervure at the point where the first median nervule arises, and reaches the inner margin at about two-thirds of its length from the base *Hindwing* with the costa at the base of the wing broadly pearly shining white, bearing in its middle a large round fuscous "scale mark," this mark being placed at the base of the first subcostal nervule by which it is equally bisected, not extending into the cell, the mark shewing clearly on the underside of the wing as a raised area the apex of the wing reaching to the second median nervule broadly black, the rest of the wing pale non-iridescent blue shading off into pure white broadly towards the anal angle; a large round black spot placed close to the margin in the first median interspace; a similar one in the submedian interspace, but placed further from the margin, the anal lobe with a large round black spot in its middle almost hidden by overlying long white hair-like scales, an anteciliary fine black thread which extends some little distance along the middle of the two tails, the thread commences at about the first median nervule and ends at the base of the inner long tail, *cilia* anteriorly black, posteriorly pure white, outer *tail* at termination of first median nervule tipped with white, anterior to this it is black, then again white to its base, in length it is 5 mms ; inner tail at termination of submedian nervure white, in length 17 mms., or about ·65 of an inch Underside, *both wings* pale bluish-white. *Forewing* with the costa and apex broadly dull brownish-ochreous, shading off into the white discal area; the inner margin broadly highly polished at the base, across this polished area lies a thick tuft of long dull brownish-ochreous hairs. *Hindwing* at the apex with a short dull ochreous-brown submarginal line ending in the second median interspace in a narrow black line, four short black lines placed in echelon across the disc, one each in the second and first median, submedian and internal interspaces, the three large round black spots on the margin towards the anal angle as on the upperside, but larger, more prominent, and of a deeper shade, the one on the anal lobe with a black line placed against it anteriorly, between the anal lobe and the line above it are a few pale greenish metallic scales, the middle black spot also bears a few similar scales scattered over it; a fine black anteciliary thread traverses the whole length of the margin and extends as above for a short distance along the bases of the tails. *Head*, *thorax*, and *abdomen* above pale blue; beneath, *palpi* and *legs* white. The *antennæ* are very interesting—the club and shaft above are black, but the shaft beneath is pure white.

Unfortunately I possess no male specimen of the type species of the genus, *Neocheritra amrita*, Felder, with which to compare the structure of *N. namoa*. As far as I can judge, however, it comes into that genus, as it possesses four subcostal nervules and a tuft of hairs attached to the inner margin of the forewing and turned under and forwards, and the cup-like depression (as seen from above) to the hindwing mentioned by Hewitson as found in the typical species Both Hewitson and Distant figure the male of *N amrita*, from which *N. namoa* differs on the upperside in the forewing having the blue area of less extent, in the hindwing in having the black apical area twice as large, in both the tails being very considerably shorter, and on the underside in having the apical area of the forewing dull brownish-ochreous, not deep fulvous or reddish-ochreous I have female specimens of *N. amrita* from Perak, Singapore, and Sumatra. To this genus probably belongs the very distinct "*Sithon*" *teunga*, Grose Smith, from Borneo[*] Another allied species is "*Hypolycæna*" *clœlla*, Weymer,[†] from the Island of Nias, of which I possess a female specimen. It has much shorter tails than *N. namoa*, and the discal series of black spots on the underside of the hindwing instead of being placed in echelon are arranged in a straight line, as they are also in *N. amrita*. The ground-colour of the two species on the underside agrees exactly, but *N clœlla* (the species is a true *Neocheritra*) has the dull brownish-ochreous coloration more extensive on the forewing Probably still another allied species (which I have not seen) is "*Sithon*" *paluana*, Staudinger, from Palawan in the Philippines[‡]

Described from an unique specimen taken on 21st May, 1893, in the

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[*] Ann. and Mag. of Nat. Hist, sixth series, vol. iii, p. 317 (1889).

[†] Stet Ent. Zeit., vol xlviii, p 10, n. 8, pl ii, fig 5, *female* (1887).

[‡] Iris, vol. ii, p. 107, pl i, fig 9, *female* (1889).

Battak mountains, deposited in Dr. Martin's collection. I have taken its name from Namoe Oekor and Namoe Blanka, two Battak villages.

37 SINTHUSA MALIKA, Horsfield, Plate V, Figs. 18, ♂, 6, ♀.

Thecla malika, Horsfield, Cat. Lep E I Co, p 90, n 22 (1829); *Dipsas malika*, Horsfield and Moore, Cat Lep Mus E I. Co., vol i, p. 37, n. 43, pl ia, fig. 5, *male* (1857), *Myrina malika*, Hewitson, Ill Diurn Lep, p 37, n 34, pl xv, figs 41–43, *male* (1863); *Sithon malika*, Kheil, Rhop Nias, p 32, n. 112 (1884), *Sinthusa malika*, de Nicéville, Butt of India, vol iii, p 487 (1890), *Sinthusa amata*, Distant, Rhop. Malay, p 461, n 2, pl xliv, fig 20, *female* (1886), id, de Nicéville, Butt. of India, vol iii, p. 488 (1890).

HABITAT Java (*Horsfield, Moore, Hewitson, coll de Nicéville*), Sumatra (*Hewitson, coll de Nicéville*), Nias (*Kheil*), Penang (*Distant, coll. de Nicéville*), Perak (*coll de Nicéville*).

EXPANSE ♂, 1 00 to 1 15, ♀, 1 2 inches.

DESCRIPTION MALE. UPPERSIDE, *forewing* deep indigo-blue, viewed from the side iridescent rich ultramarine-blue, the costa and outer margin narrowly black, broadly black at the apex. *Hindwing* much lighter blue than on the forewing, not iridescent, the costa broadly black, the abdominal margin broadly fuscous *Cilia* of the forewing black, of the hindwing pure white, except at the apex of the wing, where they are fuscous UNDERSIDE, *both wings* white with a bluish shade, the markings brownish-ochreous *Forewing* with the costa narrowly, the apex widely, the outer margin fining away to nothing at the inner angle, brownish-ochreous, an oblong broad spot at the end of the discoidal cell, a discal macular band consisting of six increasing spots, the band strongly broken in the middle, the three posterior portions of the band shifted towards the base of the wing; an obscure submarginal macular fascia from the submedian nervure, becoming lost anteriorly in the dark apical area *Hindwing* with a broad oblong spot at the end of the cell, eight small discal spots arranged in pairs irregularly across the wing from the costa to above the anal angle, a round black spot in the first median interspace on the margin, a black spot in the submedian interspace sprinkled with metallic-blue scales; a double series of small lunules on the outer margin between the spot in the first median interspace and the apex of the wing, obsolete in a Javan specimen, the small anal lobe black, crowned with metallic-blue scales. *Cilia* of the forewing brownish-ochreous; of the hindwing white, with a fine black anteciliary thread *Tail* white with a black central line. The tuft of hairs attached to the inner margin of the forewing towards the base and turned under and upwards, large and black. FEMALE. UPPERSIDE, *both wings* shining hair-brown. *Forewing* unmarked. *Hindwing* with an outer white area, separated from the outer margin by a narrow band of the ground-colour, the white area commences narrowly at the second subcostal nervule, increases in width to the abdominal margin; a narrow black anteciliary thread from the anal angle to the third median nervule. UNDERSIDE, *both wings* with the markings similar to those in the male, but of a pure ochreous shade margined with fuscous. *Forewing* with the apex also pure ochreous. The tail twice as long and twice as broad as in the male

My single Javan male specimen here figured has the blue coloration of the upperside of the forewing more extensive, the markings of the underside smaller,* the double marginal macular bands obsolete in the hindwing, the brownish-ochreous apical area of the forewing more restricted than in my numerous specimens from the Malay Peninsula and the Battak Mountains of Sumatra, but as all these features seem to be somewhat variable in my series of specimens, I think the *S. amata* of Distant should fall before *S. malika* of Horsfield.

The figure of the male is taken from my Javan specimen, that of the female from a Penang example. I have also figured, Plate V, Fig. 17, the unique type male specimen of *Sinthusa aspra*, Doherty (Journ. A. S. B., vol. lx, pt. 2, p. 180 (1891), from Mount Arjuno, 5,000 feet, Eastern Java, the specimen being in my collection.

Family PAPILIONIDÆ.

Subfamily PIERINÆ

38. DELIAS DIMAS, n. sp, Plate V, Fig. 7, ♂.

HABITAT: Java.

EXPANSE · ♂, 2 6 inches

DESCRIPTION MALE. UPPERSIDE, *forewing* black, the disco-cellular nervules marked on each side with a white line; a submarginal series of six white streaks, a small patch of grey scales at the base of the first median interspace, a much larger one below this in the submedian interspace. *Hindwing* with the extreme base, the costa, and the outer margin black, the rest of the wing white, but the area between the abdominal margin and the second median nervule tinted with primrose-yellow. UNDERSIDE, *forewing* as on the upperside, but the grey patches on the disc smaller. *Hindwing* with the base broadly black, bearing a broad crimson patch, the disc of the wing rich chrome-yellow crossed by the narrow black veins, the outer margin black, that colour ascending the veins on either side for some little distance.

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* Noted also by Hewitson.

Nearest to *D. crithoë*, Boisduval, also from Java, but differing in the submarginal series of spots on the forewing being twice as numerous, and all the disco-cellular nervules, instead of the lower one only, defined on each side with a white line, the hindwing has the white and pale yellow area much larger, thereby reducing the outer black area by one-half. Also near to *D. tobahana*, Rogenhofer, =*D. derceto*, mihi, from Sumatra, but that species lacks the two discal patches of grey scales on the forewing, has the white and yellow area on the hindwing smaller, and on the underside has the crimson band of the hindwing at least twice as broad.

Described from a single example collected by Mr. W. Doherty in Java and given to me by him as a new species. After the description above was written and the specimen figured, I received Herr Fruhstorfer's description of *D bromo*,* also from Java, from which *D. dymas* appears to differ mainly in the entire absence of the crimson base to the hindwing on the upperside.

Subfamily PAPILIONINÆ.

39. PAPILIO (*Pangerana*) HAGENI, Rogenhofer, Plate IV, Fig. 6, ♂.

Papilio hageni, Rogenhofer, Verh zool.-bot. Gesellsch. Wien, vol. xxxix, p 1 (1889); id, de Nicéville, Journ. Bomb. Natl Hist. Soc., vol. viii, p. 55, n. 16, pl. M, fig 2, *female* (1893).

HABITAT. Sumatra.

EXPANSE. ♂, 5·6 inches.

DESCRIPTION MALE. UPPERSIDE, *both wings* rich glossy black. *Forewing* with some paler streaks in the discoidal cell and between the veins. *Hindwing* with a large white patch occupying the outer half of the wing, anteriorly bounded by the second subcostal nervule, posteriorly extending just beyond the greatly curved first median nervule, not reaching the outer margin, this latter bearing four large conjoined lunular black spots; the white area bears outwardly four large round black spots, the three anterior ones equal-sized, the posterior one smaller, the white area between these last-mentioned four spots and the four black lunular spots on the margin sprinkled with black scales, the abdominal margin is as usual twice folded over, and is lined within with a white flocculent substance, the edge of the fold within being rose-pink. UNDERSIDE, *forewing* paler than on the upperside. *Hindwing* as above, except that the white area has no black sprinkling, and that there is a small white spot at the posterior end of the cell, with three similar ones in the first subcostal interspace, these latter really forming an incomplete white edging to a fifth discal black spot. *Antennæ* black. *Head* in front and *thorax* anteriorly pale buff-yellow, thorax and *abdomen* above black, thorax beneath and *legs* black, abdomen beneath rich crimson, cross-banded with black, and bearing on each side a series of small black spots, *anal valves* black.

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* *Delias bromo*, Fruhstorfer, Ent Nach., vol. xix, p. 335 (1893).

Described from a single male taken on 5th May, 1893, and generously given to me by Hofrath Dr L. Martin, who possesses one other male in his magnificent collection.

40. Papilio (*Menamopsis*) perses, n sp., Plate IV, Fig. 7, ♂.

Habitat. Gayoes Mountains, N.-E Sumatra.

Expanse: ♂, 3·7 inches.

Description Male Upperside, *both wings* fuscous. *Forewing* with the basal two-thirds very dark fuscous, the outer third lighter. *Hindwing* with a submarginal series of sullied-white streaks placed in pairs between the veins, reaching neither the outer margin nor the discoidal cell, most prominent at the anal angle, becoming obsolete towards the apex of the wing, a small round chrome-yellow spot outwardly surrounded by a black line at the extreme anal angle Underside, *both wings* uniformly pale fuscous *Forewing* immaculate. *Hindwing* with the anal spot as on the upperside, the submarginal series of white streaks longer, reaching almost to the outer margin, wider and clearer white. *Head* and *thorax* in front black, spotted with white, rest of thorax and *abdomen* black, the latter bearing three series of white spots on each side, the *anal valves* white, edged with black.

Mr W. F. Kirby has kindly compared the drawing here reproduced with the specimen of *P. hewitsonii*, Westwood, in the British Museum, which is probably the type of that species, and was figured by Mr. Hewitson in his "Exotic Butterflies," vol ii, *Papilio* pl. iv, fig 9, (1859) as the female of *P. slateri*, Hewitson. Mr. Kirby informs me that the species here described in quite distinct from the Bornean *P. hewitsonii*. The latter I have not seen, but from Hewitson's figure of it, which he says is taken from a female (Wallace, however, says the specimen is a male,* as also does Westwood,† again Mr. G. C Dudgeon has examined it and tells me that it is, with two other specimens in the British Museum, undoubtedly a male), it differs in having the outer third of the forewing lighter coloured than the rest of the wing instead of concolorous throughout; the hindwing with a prominent submarginal series of white streaks, instead of, as in *P. hewitsonii*, "two rows of indistinct white spots, in pairs, between the median nervules near the outer margin" on the upperside, those on the underside are said to form "two rows, united into distinct hastate spots pointed inwards" The chrome-yellow anal spot in *P. perses* is half the size of that in *P hewitsonii*, and the wings of my specimen are also narrower.

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* Trans. Linn. Soc. Lond., vol xxv, p. 61, n 86 (1864).

† Proc. Ent. Soc. Lond, third series, vol ii, p 10 (1864).

Described from a single example in my collection received from Hofrath Dr. L Martin, who has other specimens in his own collection. It is a perfect mimic—except for the chrome-yellow anal spot to the hindwing—of *Euplœa (Penoa) ménétriésii*, Felder, which is found flying with it.

41. Papilio (*Menamopsis*) petra, n. sp, Plate IV, Fig. 5, ♂.

Habitat Gayoes Mountains, N.-E Sumatra

Expanse ♂, 4·1 inches

Description Male Upperside, *forewing* fuscous, the area at the anal angle broadly paler; a curved discal series of eight inwardly-pointed white streaks placed one each between the veins; the series anteriorly well removed from the outer margin of the wing, approaching the anal angle posteriorly, the spots forming the series largest anteriorly, rapidly decreasing in size posteriorly, each spot bisected longitudinally by the internervular fold. *Hindwing* fuscous at the base only, the rest of the wing much paler, a submarginal series of sullied-white streaks placed in pairs between the veins, well removed from the outer margin except the two anteriormost ones, which approach it closely, a small round chrome-yellow spot placed on the anal angle, anteriorly crowned with a black lunule. Underside, *both wings* concolorous, shining pale fuscous. *Forewing* with the discal series of white streaks smaller and becoming obsolete *Hindwing* with the submarginal series of white streaks more prominent, each streak whiter, larger, and almost reaching the outer margin. *Head* and *body* as usual.

Closely allied to *P hewitsonii*, Westwood, from Borneo, and *P. perses*, de Nicéville, from the Gayoes Mountains of N-E. Sumatra From both it differs in its larger size, and in the presence of the conspicuous discal series of white streaks on the upperside of the forewing It differs from *P hewitsonii* in having the submarginal series of white streaks on the hindwing, these being obsolete or absent in that species, the anal spot is also very much smaller in *P. petra.*

Described from an unique example in the collection of Hofrath Dr L. Martin, brought down from the mountains by his Gayoes collectors in January, 1893.

Family HESPERIIDÆ.

Genus CHARMION, nov.

MALE. FOREWING, triangular, entire; *costa* gently arched; *apex* rather acute; *outer margin* very straight in general direction, slightly convex; *inner* margin straight, in length equal to the outer margin, *costal nervure* ending opposite the apex of the discoidal cell; *first subcostal nervule* arising nearly twice as far from the second subcostal as that vein does from the third; *fourth* and *fifth* subcostals arising close together; *upper disco-cellular* nervule stout, long, strongly outwardly oblique; *middle* and *lower* disco-cellulars thin, gently curved, concave, placed inwardly obliquely, the lower slightly longer than the middle, consequently the *lower discoidal* nervule lies nearer to the upper discoidal than to the third median nervule, *discoidal cell* reaching to a little less than two-thirds the length of the wing* from the base; *second median nervule* arising far from the lower end of the cell, *first* median arises near the base of the wing, with its base further from the base of the second median than that vein arises from the third; *submedian nervure* slightly sinuous. HINDWING, entire; *costa* much arched at base, then nearly straight; *apex* rather acute, *outer margin* regularly curved to the abdominal margin, slightly produced at the termination of the second median nervule, between the second median nervule and the anal angle slightly concave; *costal nervure* nearly straight, ending at the apex of the wing, *first subcostal nervule* arising far before the apex of the cell, *disco-cellular* nervules slightly outwardly oblique, *upper* disco-cellular sinuous, *lower* disco-cellular concave, slightly longer than the upper, *discoidal* nervule well developed, *second median* nervule arising well before the lower end of the cell; *first* median arising twice as far from the second, as the second arises from the third, *submedian* and *internal nervures* straight. ANTENNÆ with a well-developed club, the thin apical portion of which is directed at right-angles to the shaft. PALPI erect, pressed close to the face, densely pilose, third joint hidden beneath the hairs. ABDOMEN reaching to the level of the outer margin of the wing. LEGS. *Foreleg* with an epiphysis on the tibia. *Hindleg* with a long tuft of hairs attached to the tibia at its base, and two pairs of spines towards its apex. FEMALE. Differs from the male in the wings being slightly rounder and fuller, and lacking the tuft of hairs on the hindleg. Type, *C. ficulnea*, Hewitson.

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* Lieut. E. Y. Watson, in Proc. Zool. Soc. Lond., 1893, pp. 15 and 16, divides his subfamily *Hesperiinæ* into Sections A and B by the discoidal cell of the forewing being more or less than two-thirds the length of the costa. This is a measurement which I find very difficult to verify.

Charmion differs from *Hantana*, Moore, in the discoidal cell of the forewing being a little less than two-thirds the length of the wing, in *Hantana* the cell is obviously more than two-thirds the length. It differs from both *Hantana*, Moore, and *Celænorrhinus*, Hübner, in having the middle and lower disco-cellular nervules of the forewing considerably more upright, and the second median nervule arising far from instead of close to the lower end of the cell The imago rests on the underside of leaves with wide-spread wings

(1) CHARMION FICULNEA, Hewitson.

Hesperia ficulnea, Hewitson, Descr *Hesperidæ*, p 37, n 33 (1868), ——*ficulnea*, Watson, Proc. Zool Soc. Lond, 1893, p 113, *Plesioneura signata*, Druce, Proc. Zool Soc. Lond, 1873, p 360, n 3, pl xxxiii, fig 8; *Notocrypta signata*, de Nicéville, Journ. Bomb. Nat. Hist. Soc, vol iv, p. 191, n. 14 (1889), idem, id, l. c, vol vi, p. 380, n. 26 (1891)

HABITAT Borneo (*Hewitson* and *Druce*), Victoria Point, Lower Tenasserim, Perak, Malay Peninsula, Siam, N.-E. and S.-W. Sumatra, S.-E. Borneo (*de Nicéville*).

(2) CHARMION TOLA, Hewitson

Plesioneura tola, Hewitson, Ann and Mag of Nat Hist, fifth series, vol i, p. 340 (1878), *Notocrypta tola*, de Nicéville, Journ. Bomb. Nat Hist Soc, vol iv, p 191, n 15 (1889); *Plastingia ? plesioneuræ*, Staudinger, Ex. Schmett, p 299, pl c, *female* (1888)

HABITAT Tondano (*Hewitson*), Minahassa, Celebes (*Staudinger*).

I have not seen the "*Plesioneura*" *tola* of Hewitson From the description it appears to differ from *C ficulnea*, Hewitson, in the forewing in the discal band extending posterior to the first median nervule, in *C ficulnea* it ends on that vein. I have put *P. tola* in the genus on Lieut E. Y Watson's authority. Neither have I seen Dr Staudinger's "*Plastingia ?*" *plesioneuræ*, but as the figure agrees exactly with Hewitson's description, I have no hesitation in placing it here

Genus SEPA, nov.

MALE FOREWING, *costa* almost straight, *apex* acute; *outer margin* almost straight, very oblique, *inner margin* straight, exactly as long as the outer margin, *costal nervure* ending a little before the apex of the discoidal cell; *subcostal nervules* arising at gradually decreasing distances apart, *discoidal cell* long, extending beyond the middle of the wing; *upper disco-cellular nervule* short, straight, outwardly oblique, *middle* and *lower disco-cellulars* of nearly equal length, straight, strongly inwardly oblique, the middle a little longer than the lower, *second median* nervule arising a little before the lower end of the cell, *first median* arising nearer the base of the wing than the lower end of the cell, *submedian nervure* straight, a sexual brand, or "male-mark," extends obliquely across the submedian and first median interspaces and ends anteriorly on the second median nervule a little in front of its origin. HINDWING, *costa* greatly arched at the base, thence straight to the apex, *apex* rather acute, *outer margin* evenly and regularly convex to the anal angle; *anal angle* very acute; *abdominal margin* straight; the wing extends a little beyond the apex of the abdomen, the cilia towards the anal angle very long, *costal nervure* ending at the apex of the wing, *first subcostal nervule* arising long before the apex of the cell, *disco-cellular* nervules almost in one straight line, outwardly oblique, the upper a little longer than the lower, *discoidal* nervule obsolete, but its position is indicated, were it to be present, by a fold in the wing membrane, and by this fold the relative length of the disco-cellular nervules is given, *second median* nervule arising just before the lower end of the cell, *first* median arising about four times as far from the second as the second does from the third, *submedian* and *internal nervures* straight. LEGS. *Hindleg* with two pairs of spines on the tibia

Sepa is nearest allied to *Matapa*, Moore, from the type species of which it may be at once known by the discoidal cells of both wings being more truncate at the end owing to the disco-cellular nervules being less strongly oblique; the shape of the wings differs also, the inner margin of the forewing in *Matapa* is longer than in *Sepa*, consequently the outer margin in the former is less oblique than in the latter; the hindwing differs in that, in *Matapa*, the anal angle appears to be somewhat produced owing to the wing about the termination of the first median nervule being somewhat emarginate, in *Sepa* the wing is evenly curved throughout. Type, *Sepa cronus*, de Nicéville

42. SEPA CRONUS, n. sp., Plate V, Fig 4, ♂.

HABITAT. Battak Mountains, N.-E. Sumatra.

EXPANSE: ♂, 1·7 inches.

DESCRIPTION MALE UPPERSIDE, *both wings* rich dark shining brown. *Forewing* with three pale ochreous dots, two subapical, the anterior one most minute, the third in the second median interspace about twice the size of the lower subapical spot, a narrow obscure discal black stigma or "male-mark" crossing obliquely the submedian and first median interspaces, that portion of the stigma in the latter interspace having a prominent pale ochreous semi-transparent line placed outwardly against it. *Hindwing* immaculate UNDERSIDE, *both wings* exactly as above except that the ground-colour is dull, not shining *Cilia* concolorous with the wings throughout, those of the hindwing at the anal-angle unusually long, though not quite as long as in *Lophoides iapis*, de Nicéville, from Burma, the Malay Peninsula, Sumatra, Java, and Pulo Laut. *Antennæ* black, the club beneath, except the extreme tip, ochreous. *Eyes* with a band of dull ochreous setæ encircling them. *Body* concolorous with the wings throughout.

Described from a single example from the Battak Mountains taken in September, and deposited in Dr. Martin's fine collection.

Genus Ochus, nov.

MALE. FOREWING, entire, *costa* strongly and evenly arched throughout its length, *apex* somewhat rounded, *outer margin* strongly convex, *inner* margin considerably longer than the outer margin, nearly straight, slightly concave in the middle, *costal nervure* ending opposite the apex of the discoidal cell, *subcostal nervules* very long owing to the highly arched costa, arising progressively from the base of the wing at decreasing distances apart, *discoidal cell* broad, short, extending to a little beyond the middle of the wing, *upper disco-cellular nervule* long, straight, slightly outwardly oblique, *middle* and *lower* disco-cellulars of equal length, a little longer than the upper, directed inwardly slightly obliquely, the middle concave, the lower straight, *lower discoidal* nervule lying midway between the upper discoidal and third median nervules; *second median* nervule arising well before the lower end of the cell, *first median* arising nearer the lower end of the cell than the base of the wing, *submedian nervure* nearly straight. HINDWING, entire, oval, *costa* arched, *outer margin* evenly rounded to the anal angle, *abdominal margin* short, nearly straight, *costal nervure* short, *first subcostal nervule* arising a short distance before the apex of the cell, *discoidal cell* short, less than half the length of the wing, *disco-cellular* nervules concave, placed slightly outwardly obliquely, *discoidal* nervule absent, *second median* nervule arising very close to the lower end of the cell, *first median* arising nearer the lower end of the cell than the base of the wing, *submedian* and *internal nervures* straight, the latter rather short ANTENNÆ short, less than half the length of the costa of the forewing, club rather slender, long, straight, ending regularly and evenly in a point. PALPI rather thinly and laxly clothed with hairs, porrected forwards in front of the face, third joint rather long, hairy. THORAX weak, small. ABDOMEN very slender, long, extending beyond the anal angle of the hindwing Male with no secondary sexual characters. FEMALE differs from the male only in its broader and more rounded wings. LEGS *Foreleg* with an epiphysis on the tibia. *Hindleg* with two pairs of spines on the tibia. Type, *O. subvittatus*, Moore.

Ochus apparently finds its place amongst the final genera of Lieut. E. Y. Watson's subfamily *Pamphilinæ*, Section A (Proc. Zool. Soc. Lond., 1893, p. 72), which contains the genera *Argopteron*, Watson, *Heteropterus*, Dumeril, *Pamphila*, Fabricius, and *Cyclopides*, Hübner. *Ochus* is apparently nearest to *Pamphila*, of which the type is *P. palæmon*, Pallas, and from which it is abundantly distinct; the costa of the forewing is greatly arched instead of straight, the apex is rounded instead of being acute, the outer margin is more rounded, the discoidal cell is much shorter and broader, the hindwing is more oval, the discoidal cell is again much shorter, the discoidal nervule is obsolete, in *P. palæmon* it is present, besides many other minor differences. The imago rests with wings closed over its back Of all the Indian species of *Hesperiidæ*, *O. subvittatus* probably has the feeblest flight, appearing on the wing to be a dark-coloured, low-flying lycænid, similar to a female of the wet season form of *Zizera maha*, Kollar, or some other dark-coloured "blue." Lieut. Watson suggests in Proc Zool Soc. Lond, 1893, p 97, that "*Cyclopides*" *subvittatus* belongs to the North American genus *Ancyloxypha*, Felder, or to one closely allied to it, but this is not the fact, *Ochus* is widely distinct from that genus, and comes into the first section of the subfamily instead of the second containing the genus in question.

(1). OCHUS SUBVITTATUS, Moore

Cyclopides subvittatus, Moore, Proc. Zool Soc Lond, 1878, p 692; id, Wood-Mason and de Nicéville, Journ. A. S B, vol. lv, pt. 2, p 392, n 249, pl xvii, figs 6, 6a, *male*, × 2 (1886); id, Elwes, Trans. Ent. Soc. Lond, 1888, p 453, n. 487; *Cyclopides subradiatus*, Moore, Proc Zool Soc. Lond, 1878, p. 693.

HABITAT: Darjeeling, Salween district, Moulmain, Burma (*subvittatus*), Khasia Hills (*subradiatus, Moore*), Kumaon (*Doherty*); Sikkim, Bhutan, Assam, Burma (*coll. de Nicéville*).

It is, I think, quite impossible to separate *O. subradiatus* from *O subvittatus*. Mr. Moore places the former in the middle of the region inhabited by *O. subvittatus*. I have caught it as far south as the Dawnat range and Meplé in Middle Tenasserim, in the month of October

43. ERYNNIS DIMILA, Moore, Plate I, Fig. 7, ♂.

Pamphila dimila, Moore, Proc Zool. Soc. Lond, 1874, p. 576; id, de Nicéville, Journ. Bomb. Nat. Hist Soc, vol vii, p. 355, n. 23, pl J, fig 9, *female* (1892); *Erynnis comma*, var. *dimila*, Leech, Butt. from China, Japan, and Corea, p 595, pl. xli, fig 12, *male* (1893).

HABITAT: Runang Pass, south-east side, about 13,000 feet elevation, Busahir (*Moore*); Khibber Nala, about 16,000 feet elevation, Spiti (*Sage*); Ganges Valley, near Nilung Pass, 16,000 feet, August, 1893 (*Mackinnon*), Tá-chien-lu, Western China (*Leech*).

As I have already figured the female of this rare species, I now take the opportunity to figure the male. Mr. P. W. Mackinnon through his native collectors obtained three male specimens, of which he has generously presented me with two. The species appears to me to come into the genus *Erynnis* of Schrank, of which the type is *E. comma*, Linnæus, the British "Small Skipper." The shape and markings of the two species is very similar, but the male of *E. dimila* has the ochreous ground-colour of the upperside much more extensive than in *E. comma*, especially so on the hindwing, the spots on the underside of both wings are also more prominent, larger, and whiter than in *E comma*. The club of the antenna is somewhat differently shaped, the terminal portion or apex in *E dimila* being considerably longer than in *E. comma*.

Since the above was in type, I have received Part V of Mr. Leech's "Butterflies from China, Japan, and Corea," in which a single male of *E. dimila* is recorded from Western China and duly figured If this specimen is really typical (the plate in which it is figured has not as yet been published), it greatly extends the range of the species. Mr. Leech considers *E dimila* to be a "var." only of *E. comma*, Linnæus, and records the parent species from Europe, Amurland, Corea, Japan, N.-W. Himalayas, N. and W. China.

44. PADRAONA PAVOR, n. sp., Plate IV, Fig. 8, ♂

HABITAT: Battak Mountains, N.-E. Sumatra.

EXPANSE ♂, 1·2 to 1 3 inches

DESCRIPTION MALE. UPPERSIDE, *both wings* shining black tinged with bronzy. *Cilia* golden-orange, broadest towards the anal angle of the hindwing, gradually becoming dusky as the apex of the forewing is reached in some specimens *Forewing* with an orange streak on the basal two-thirds of the costa, widening out at the end of the discoidal cell, crossed by the black costal and subcostal veins, an orange streak on the basal two-thirds of the inner margin, a discal straight series of seven orange spots, extending from the costa to the submedian nervure, the series broken between the third and fourth spots from the costa, the three uppermost spots linear, small, increasing; the fourth in the second median interspace quadrangular, the fifth in the first median interspace also quadrangular, but twice as large as the one anterior to it, two spots in the submedian interspace, the anterior one very small. *Hindwing* with some orange streaks from the base reaching to the middle of the wing formed of long setæ, a transverse band of five orange spots across the middle of the disc. UNDERSIDE, *both wings* rich dark brownish-orange. *Forewing* with the posterior half black; a prominent oblique orange-yellow streak at the end of the cell; the discal series of spots as above, except that the four posterior ones are larger than on the upperside, the two posteriormost conjoined. *Hindwing* with a curved discal series of five spots, the four anterior ones are of a slightly lighter shade than the ground-colour, outwardly defined by a very narrow black line, the fifth posterior spot the largest and of a bright yellow colour, with another somewhat diffused spot beyond reaching the outer margin, a black anteciliary thread from the apex of the wing to the first median nervule.

This appears to be a very distinct species, differing from all others of the genus known to me (*Padraona dara*, Kollar, = *P. mœsa*, Moore; *P. mœsoides*, Butler, *P. pseudomœsa*, Moore, *P. gola*, Moore, *P. goloides*, Moore, *P. augiades*, Felder, *P. olivescens*, Herrich-Schaffer, *P. palmarum*, Moore, *P. procles*, de Nicéville) in lacking in the forewing on the upperside the two spots divided by the lower discoidal nervule invariably present in all those species. It agrees with *P. procles* and *P. olivescens* in having no spots in the hindwing anterior to the discal band towards the costa and base of the wing. It possesses, moreover, a male-mark, which is, I believe, unique in the genus, consisting of a shining pale silky streak to be seen in some lights only on the upperside of the forewing placed within the discal band of spots in the lower median and submedian interspaces. I may add that the entire coloration of the species is very dark and rich.

Described from numerous specimens in Dr. L. Martin's collection and my own, some of which were taken in June.

45. HALPE HIERON, n. sp., Plate IV, Fig. 1, ♂.

HABITAT: N.-E. Sumatra.

EXPANSE: ♂, 1·15 to 1·25 inches.

DESCRIPTION: MALE. UPPERSIDE, *both wings* shining hair-brown. *Forewing* with, in some specimens, two exceedingly obscure pale spots in the median interspaces, placed obliquely as usual in the genus, the lower one nearer the base of the wing than the upper; in some specimens these spots are entirely absent, no "male-mark." *Hindwing* immaculate. UNDERSIDE, *forewing* with the inner margin broadly pale fuscous, the rest of the wing dull ochreous-grey, the two median spots sometimes present on the upperside always present, conspicuous, whitish, a very obscure submarginal series of pale spots in a curved series from the costa to about the first median nervule; a very fine anteciliary dark thread. *Hindwing* pale fuscous, heavily irrorated throughout with dull ochreous-grey scales. *Cilia* of the forewing sometimes faintly checkered, more often concolorous with the wing, on the hindwing always concolorous. *Antennæ* black, the base of the club beneath pale ochreous. *Palpi, thorax,* and *abdomen* above hair-brown, palpi, thorax, and abdomen beneath dull ochreous-grey.

This dull-coloured, obscurely-marked species is evidently allied to *Halpe homolea*, Hewitson (*H. sikkima*, Moore), from which it may instantly be known by the upperside being practically spotless, and the underside but very faintly instead of prominently marked. It has also no discal stigma on the upperside of the forewing in the male.

Described from numerous specimens in Dr. Martin's and my collections taken at Bekantschan in August and September, and in the Battak Mountains, in August, both in N.-E. Sumatra.

46. KERANA FULGUR, n sp, Plate I, Fig 6, ♀.

HABITAT Selessoh, N.-E. Sumatra.

EXPANSE · ♂, ♀, 1·7 inches.

DESCRIPTION FEMALE. UPPERSIDE, *both wings* dark shining purplish-fuscous. *Cilia* concolorous *Forewing* with a broad discal orange fascia, anteriorly not quite reaching the costa, posteriorly ending on the submedian nervure. *Hindwing* immaculate UNDERSIDE, *both wings* with the ground-colour duller than on the upperside *Forewing* with the apex faintly dusted with ochreous scales, the discal orange band more extensive than on the upperside, reaching the inner margin, where it is much paler, the edges of the band more irregular. *Hindwing* unmarked, except by the following steel-blue spots, which can be seen in all lights, but are more prominent in some lights than in others·—An elongated one closing the discoidal cell, one in the first median interspace about its middle, and three in the submedian interspace at about equal distances apart *Antennæ* black above, the club beneath ochreous *Palpi* black above, beneath chrome-yellow. *Eyes* encircled by a band of chrome-yellow. *Head, thorax*, and *abdomen* above fuscous, abdomen beneath with six ochreous lines

Nearest to *K gemmifer*, Butler,* (which also occurs in N-E. Sumatra, as well as in Perak and Malacca, I have taken it on the Penang Hill at 2,200 feet elevation above the sea, in November), from the same sex of which it differs in being larger, the ground-colour of the upperside darker, the gem-like spots of the underside quite different, and the abdomen beneath striped with ochreous instead of being concolorous The "gems" of *K gemmifer* have never been described in detail. Mr. Butler refers to them thus —"End of cell and apical area of primaries and disk of secondaries [on the underside] spotted, in certain lights, with shining amethyst-coloured spots" in both sexes. They are thus disposed —*Forewing* with an elongated one placed on the fold in the middle of the discoidal cell just anterior to the inner edge of the discal orange fascia, three subapical ones placed one above the other, divided by the veins; *hindwing* with from four to six placed one each between the veins in a curve beyond the end of the cell. It is doubtful if Mr. Distant recognised the species, as he makes no mention[*] of the "gems," and his figure of the species does not shew them, nor does it agree with my specimens of *K. gemmifer*, the orange band on the underside of the forewing in true *K. gemmifer* being almost of equal width throughout, while in Mr. Distant's figure the costal portion is much narrowed and constricted. Lieut. Watson, indeed, says[†] that Mr. Distant's *K. gemmifer* equals *Koruthaialos xanites*, Butler, which is probable enough, that species being infinitely more common than *K. gemmifer*, the latter occurring very sparingly.

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* *Astictopterus gemmifer*, Butler, Trans. Linn Soc. Lond., Zoology, second series, vol. i, p. 555, n. 8 (1877).

A single example of *K. fulgur*, now in Dr. Martin's collection, was taken by myself in the splendid virgin forest at Selesseh, in the Langkat district of N.-E. Sumatra, on 31st October, 1893. Since this specimen was drawn and the plates illustrating this paper made up, Dr. Martin sent me in a letter a male of *K. fulgur*. I hope to figure and describe it fully hereafter. It greatly differs from the female on the upperside in the orange fascia of the forewing being much paler, more chrome-yellow in shade, larger, and posteriorly continued almost to the base of the wing; and the base of the hindwing and base of the abdomen are clothed with long chrome-yellow setæ.

47. PLASTINGIA VERMICULATA, Hewitson, Plate V, Fig. 15, ♂.

Hesperia vermiculata, Hewitson, Ann. and Mag. of Nat. Hist., fifth series, vol. i, p. 316 (1878).

HABITAT: N.-E. Sumatra.

EXPANSE: ♂, 1·7 inches.

DESCRIPTION: MALE. UPPERSIDE, *both wings* black. *Forewing* with the following opaque chrome-yellow markings:—A narrow subcostal streak extending from the base of the wing to about its middle, a similar but shorter and broader streak in the submedian interspace, with the following semi-transparent yellow spots:—Two very narrow and small ones placed obliquely towards the end of the discoidal cell, the upper the larger, furthest from the base of the wing, the lower minute; a dot in the lower discoidal interspace, a spot four times as large in the second median interspace; a very large spot in the first median interspace. *Cilia* black. *Hindwing* with a basal streak of long chrome-yellow hairs which runs into a broad transverse fascia of the same colour placed in the middle of the wing; the anal area very broadly chrome-yellow, which area rapidly fines away to nothing at about the termination of the third median nervule; a streak of chrome-yellow placed in the submedian interspace springs from the base of the wing and runs into the yellow anal area, the abdominal margin and *cilia* chrome-yellow UNDERSIDE, *forewing* fuscous, the costa, discoidal cell, apex and outer margin decreasingly to the anal angle streaked with chrome-yellow, the five semi-transparent spots as above, a broad, short, chrome-yellow streak towards the base of the wing in the submedian interspace, a pale blue slightly iridescent streak just beyond the end of the cell in the upper discoidal interspace *Hindwing* chrome-yellow, with the following black markings,—The costa at the base of the wing, two subcostal streaks from the base to the apex of the wing, the posterior of these interrupted towards its end, a streak in the subcostal interspace also outwardly interrupted, a streak in the cell, a very broad one twice interrupted in the submedian interspace, a rather obscure streak in the internal interspace, extending from the base to a little beyond the middle of the wing, three small spots on the disc between the veins also with the following pale blue slightly iridescent elongated spots —Two in the discoidal cell, and a series of eight others extending right round its outer end. *Antennæ* black, club prominently chrome-yellow above, the apex black *Palpi* black above, yellow beneath *Thorax* above black clothed with long yellow hairs. *Abdomen* black, ringed with yellow. *Legs* yellow

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[*] *Kerana gemmifer*, Distant, Rhop. Malay., p. 403, n. 2, pl. xxxiv, fig. 29 (1886).

[†] Proc. Zool. Soc. Lond., 1893, p. 77.

The nearest ally to *P vermiculata* appears to be the "*Hesperia*" *flavescens* of Felder (Reise Novara, Lep, vol III, p 517, n 905, pl. lxxii, figs 7, *male*, 8, 9, *female*, 1867), from Celebes, from the female sex of which the present species differs in several particulars on the upperside, and conspicuously on the underside, in the presence of the pale blue slightly iridescent spots, these being apparently entirely absent in *P. flavescens*

This very lovely species is described from an unique example in Dr. Martin's collection taken at Bekantschan, at the foot of the Battak Mountains, in N.-E. Sumatra, in July, 1893. Mr. Hewitson originally obtained it from Sumatra also

EXPLANATION OF THE PLATES

PLATE I.

Fig. 1. *Mycalesis* (*Satoa*) *maia*, n sp, ♂, p. 1.
" 2. " " " " ♀, p. 1.
" 3. *Euthalia* (*Dophla*) *eson*, n sp, ♂, p 12.
" 4 *Stichophthalma sparta*, n sp, ♂, p 2
" 5. *Euthalia* (*Dophla*) *eson*, n sp, ♀, p 12
" 6. *Kerana fulgur*, n sp, ♀, p 55
7. *Erynnis dimila*, Moore, ♂, p 52.

Fig. 8 *Neptis clinioides*, n. sp., ♂, p. 6

„ 9. „ *nisæa*, n. sp., ♂, p. 7.

PLATE II.

Fig. 1 *Euthalia (Dophla) externa*, n. sp., ♂, p. 13

„ 2 „ „ „ , ♀, p. 13

„ 3 „ „ *curius*, n. sp., ♂, p. 15

„ 4 „ „ „ , ♀, p. 15.

„ 5 „ „ *gupta*, de Nicéville, ♀, p. 18.

„ 6 *Laxita laocoon*, n. sp., ♀, p. 20

„ 7 „ *iola*, n. sp., ♀, p. 20

„ 8 „ *lyncestis*, n. sp., ♂, p. 22

„ 9 „ *iola*, n. sp., ♂, p. 20

„ 10 „ *lyclene*, n. sp., ♂, p. 21

„ 11. *Everes moorei*, Leech, ♂, p. 32

„ 12 *Cyaniris crissa*, n. sp., ♂, p. 31

„ 13 *Logania luca*, n. sp., ♀, p. 28

PLATE III.

Fig. 1 *Argynnis niphe*, Linnæus, ♂ and ♀, p. 8

„ 2. „ „ „ p. 8

„ 3 *Euthalia sakii*, n. sp., ♀, p. 9

„ 4. *Herona pringondani*, Fruhstorfer, ♀, p. 4

„ 5 „ „ ♂, p. 4

„ 6 *Euthalia (Dophla) cion*, n. sp., ♀, p. 11

„ 7. *Herona sumatrana*, Moore, ♀, p. 5

„ 8. *Euthalia (Dophla) cion*, n. sp., ♂, p. 11

PLATE IV.

Fig. 1 *Halpe hieron*, n. sp., ♂, p. 54

„ 2 *Pithecops mariæ*, n. sp., ♂, p. 30

„ 3 *Listeria dudgeonii*, n. sp., ♂, p. 36

„ 4 *Tajuria blanka*, n. sp., ♀, p. 39

„ 5 *Papilio (Menamopsis) petra*, n. sp., ♂, p. 47

„ 6 „ *(Pangerana) hageni*, Rogenhofer, ♂, p. 45

„ 7 „ *(Menamopsis) perses*, n. sp., ♂, p. 46

„ 8 *Padraona paron*, n. sp., ♂, p. 53

„ 9. *Pithecops mariæ*, n. sp., ♀, p. 30

„ 10 *Simiskina solyma*, n. sp., ♀, p. 29

„ 11 *Arhopala constanceæ*, n. sp., ♀, p. 31.

PLATE V.

Fig. 1. *Gerydus gigantes*, n. sp., ♂, p. 23

„ 2 *Paragerydus pyrus*, n. sp., ♂, p. 27

„ 3 *Lampides lucide*, n. sp., ♂, p. 33

„ 4 *Sepa cronus*, n. sp., ♂, p. 50

„ 5 *Aphnæus hiendlmayrii*, n. sp., ♀, p. 38

„ 6 *Sinthusa malika*, Horsfield, ♀, p. 43

„ 7 *Delias dymas*, n. sp., ♂, p. 44

Fig 8. *Cyrestis theresæ*, n. sp., ♂, p. 18.
" 9. *Neocheritra namoa*, n sp., ♂, p. 41.
" 10 *Charana cepheis*, n sp, ♂, p. 40.
" 11. *Gerydus gallus*, n sp, ♀, p 25
" 12. " *gætulus*, n. sp, ♀, p 24
" 13 " *gigantes*, n. sp, ♀, p 23.
" 14 *Paragerydus portunus*, n sp, ♂, p 27
15. *Plastingia vermiculata*, Hewitson, ♂, p 56
16. *Camena cremera*, n sp, ♂, p 37.
17 *Sinthusa aspra*, Doherty, ♂, p. 44
18. " *malika*, Horsfield, ♂, p. 43

On the Chemical Examination of certain Indian Food Stuffs. Part I, Fats and Oils.—*By* P. C. Ray, D. Sc. *Communicated by* Alex. Pedler, F.R.S.

[Read February 7th.]

Of late years a belief has been gaining ground in Calcutta, Bombay and in many other important towns in India, not apparently without reason, that wholesale adulteration is practised in many of the common articles of diet, notably in ghee, butter, milk, mustard oil, &c. The present investigation was undertaken with a view to throw some light on these points, and it embodies the results of work carried on at intervals during the last four years

PRELIMINARY.

As butter enters largely into the dietary of the people of Europe and America, abundant work has been done by Chemists on its analysis. It is, however, well-known that the composition of milk and of the butter made from it is, within certain limits, dependent on the breed, climate, method of feeding the cows, period of lactation, and so on The standard for genuine butter as generally accepted in England, especially at Somerset House, cannot therefore be always accepted as a safe guide in this country.

The analysis of the fixed oil of mustard and the various other oils with which it is generally sophisticated also presents considerable difficulties. Not much work has been done in this field. The history of the substances which have been subjected to analysis is seldom given, and the experimental methods are not generally described in sufficient detail to enable the results to be compared. While the information available is meagre on the one hand, the results published from time to time are in themselves in some cases contradictory. It was thus found to be necessary to work out in the first instance a series of *constants* for such Indian food-stuffs as mustard oil, butter, ghee, &c , which might be of some help in deciding cases of falsification.

Particular care was taken in procuring genuine samples of the substances The oils were, in many cases, expressed under direct supervision from seeds carefully selected, so that the purity of the products was unquestionable A sample of pure mustard oil was also obtained through the courtesy of the Superintendent, Alipur Jail, and another of cocoanut oil from the officer in charge of the "Copra" works, Viper Island, Port Blair, with a certificate from him, guaranteeing its purity, and stating it to be a standard sample

The preliminary examination of the fats and oils is much helped by the determination of certain physical *constants*, *e g* , melting point, specific gravity, index of refraction, &c The work in the present communication is confined solely to the chemical methods The application of the physical tests, is reserved for a future occasion

The fats and oils are simply combinations of certain acids, the so-called fatty acids, *e g* , butyric, stearic, oleic, palmitic, &c , with glycerin , hence they have been named the *glycerides* By estimating the amount of both or either of these constituents of fatty substances, valuable information is obtained as to their nature Now, if a fat be treated with an alkali, the fatty acids contained in it combine with the alkali, resulting in the formation of organic salts, commonly called a *soap*, and the separation of glycerin It so happens, however, that the molecular weights of some of these fatty acids vary within wide limits Thus, butyric acid, occurring in butter-fat has a molecular weight equivalent to 88, while erucic acid, a component of mustard oil, has a molecular weight of 338 A molecule of caustic potash weighing 56, will exactly neutralise 88 parts by weight of butyric acid or 338 parts by weight of erucic acid Hence a given weight of butter-fat will require a far larger proportion of caustic potash to convert it into soap—to *saponify* it, as it is technically called—than the same weight of mustard oil Koettstorfer has made use of this principle It has in fact been found by actual experiments that while 100 grammes of butter-fat require very nearly 22 grammes of caustic potash for saponification, the same weight of mustard oil requires only 17 grammes of the alkali The amount of glycerin in a fat or oil also will vary in a corresponding manner

Again butyric, caproic and other volatile acids present in cocoa-nut oil, butter-fat, &c , may be easily separated from the non-volatile acids by distillation, and their amount ascertained by their potash neutralising power. Upon this principle is based the well-known Reichert's test The amount of iodine absorbed by different fats and oils also lies within wide ranges. The iodine absorption test has been employed with remarkable success by Baron Hubl in deciding cases of adulteration

The following processes have been made use of —

1. Direct titration of the fats and oils by alcoholic potash—
   Koettstorfer's test
2. Estimation of the amount of glycerin
3. Iodine absorption test of Hubl
4. Estimation of the volatile fatty acids—Reichert's test

The detailed results obtained by each of these methods as applied in the present inquiry will now be described

KOETTSTORFER'S METHOD

Most of the oils, when recently expressed, contain suspended impurities derived from the seeds, &c, in a very fine state of division These settle down in course of time The oils thus clarified by subsidence were filtered through bibulous paper to remove any traces of adherent moisture which might be present The application of even a gentle heat cannot be resorted to for this purpose Mustard oil, which is classed among the non-drying oils, was found to gain in weight continually when placed inside the chamber of a water-oven and weighed at intervals of 15 to 20 minutes

PREPARATION OF ALCOHOLIC POTASH —The alcoholic solution of potash, approximately of semi-normal strength was prepared by dissolving sticks of potash in pure alcohol The solution, filtered off the insoluble residue, is generally found to have a reddish-yellow color. It has therefore to be decolorised by shaking with pure animal charcoal

OIL OF MUSTARD.

Sinapis nigra, S alba (Nat. order—Cruciferæ)

Different samples of mustard seeds were found to yield a fixed oil varying from 32°/₀ to 36°/₀ of the air-dried seeds

1. 2 534 gm oil were weighed into a bottle of about 12 oz capacity, and 20 c c of alcoholic potash solution were added The mouth of the bottle was closed with an India-rubber cork, fastened by means of wire The bottle was kept immersed in boiling water for 45 minutes. A blank experiment under exactly similar conditions was made side by side to determine the strength of the potash. The indicator used was phenolphthalein—

$$20 \text{ c. c. KOH} = 20\ 7 \text{ c. c. } \frac{N}{2} \text{ HCl.}$$

4·95 c. c $\frac{N}{2}$ HCl were required to neutralise the excess of alkali.

(20·7 − 4·95) c. c. or 15·75 c. c. $\frac{N}{2}$ HCl represent the amount of alkali required for the saponification of the oil.

$$1 \text{ c c } \frac{N}{2} \text{ HCl} = 0{\cdot}02805 \text{ gm. KOH}$$

Amount of potash consumed by 1,000 gm. oil (=*saponification equivalent*), is therefore equal to $\frac{15{\cdot}75 \times 0{\cdot}02805 \times 1000}{2{\cdot}534}$ gm. = 174·5 gm.

2. 1·713 gm. oil were heated in a flask over a water-bath for ten minutes with 20 c c KOH solution, the mouth of the flask being covered by a watch-glass—

20 c c. KOH = 20·7 c c $\frac{N}{2}$ HCl (Blank experiment)

10·1 c c. $\frac{N}{2}$ HCl were required by the excess of potash

$$\text{Saponification equivalent} = \frac{10{\cdot}6 \times 0{\cdot}02805 \times 1000}{1{\cdot}713} = 173{\cdot}5$$

3. Mustard oil expressed from a different sample of seeds.

3·084 gm. oil were treated with 20 c c KOH solution in a bottle, which was immersed in boiling water for about 40 minutes, the mouth of the bottle being closed by an India-rubber cork tied down by means of wire—

20 c. c. KOH = 20·8 c. c. $\frac{N}{2}$ HCl (Blank titration)

1·5 c. c. $\frac{N}{2}$ HCl were required for the excess of potash.

or 19·3 c. c. $\frac{N}{2}$ HCl represented the amount of alkali used up.

$$\text{Saponification equivalent} = \frac{19{\cdot}3 \times 0{\cdot}02805 \times 1000}{3{\cdot}084} = 175{\cdot}5$$

4. 2·222 gm oil were treated with 20 c. c. KOH solution and heated in a flask over a water-bath for 12 minutes, the mouth of the flask being covered with a watch-glass—

Excess of alkali required 7 c. c. $\frac{N}{2}$ HCl

20 c. c. KOH ,, 20·8 ,, ,, (Blank titration).

$$\text{Saponification equivalent} = \frac{13{\cdot}8 \times 0{\cdot}02805 \times 100}{2{\cdot}222} = 174{\cdot}2$$

5. 1.8012 gm. oil were saponified under the same conditions as described above, with 40 c. c. KOH solution—

$$40 \text{ c. c. KOH} = 32·0 \text{ c. c. } \frac{N}{2} \text{ HCl}$$

$$\text{Excess of alkali} = 21·0 \text{ ,, } \quad \text{,,}$$

$$\text{Saponification equivalent} = \frac{0·02805 \times 11 \times 10^3}{1·8012} = 171·3$$

6 Pure mustard oil from Alipur Jail.

3·493 gm oil were mixed with 20 c c. potash solution and the mixture kept immersed in boiling water for over half-an-hour. The mouth of the bottle being closed by a cork fastened by a wire—

$$20 \text{ c. c KOH} = 30·7 \text{ c. c. } \frac{N}{2} \text{ HCl}$$

$$\text{Excess of alkali} = 9·2 \text{ ,, } \quad \text{,,}$$

$$\text{Saponification equivalent} = \frac{21·5 \times 0·02805 \times 10^3}{3·493} = 172·7$$

7. Duplicate analysis of the above. 2·195 gm. oil heated to boiling on a water-bath with 20 c c KOH solution for 15 minutes, the mouth of the flask being covered with a watch-glass.

$$20 \text{ c. c. KOH} = 30·7 \text{ c. c } \frac{N}{2} \text{ HCl (Blank experiment)}$$

$$\text{Excess of alkali} = 17·2 \text{ ,, } \quad \text{,,}$$

$$\text{Saponification equivalent} = \frac{13·5 \times 0·02805 \times 10^3}{2·195} = 172·5$$

It would thus appear that mustard oil is very easily saponified by alcoholic potash, and that a large excess of the latter is not necessary

The oil was in some cases found to have a pale yellow color, in others the tint was somewhat deeper The soap solutions were tinged accordingly. The want of exact uniformity in the tint sometimes interfered with the exact determination of the conclusion of the reaction during the titrations. It may also be stated that the soap solutions were generally diluted with about 25 c. c of hot water, from which all traces of carbonic acid gas had been driven off by boiling

In the above experiments it will be seen that the saponification equivalent of the samples of mustard oil has varied between 175·5 and 171·3, the average of the seven determinations being 173·5

Hence it would be safe probably to adopt the saponification equivalent of mustard oil as lying between 171—175.

SAPONIFICATION EQUIVALENT FOR NIGER-SEED OIL.

Guizotia abyssinica (Nat ord.—Compositæ).

As this oil is one of the commonest adulterants of mustard oil, a genuine sample of it was procured for experiments

1 1.4605 gm oil were weighed out into a flask, 20 c.c. of alcoholic potash were then added, the mixture covered with a watch-glass and treated to gentle boiling, with occasional agitation for 15 minutes.

$$20 \text{ c. c. KOH} = 15·95 \text{ c. c } \frac{N}{2} \text{ HCl (Blank experiment)}$$

Excess of alkali = 6·1 ,, ,,

$$\text{Saponification equivalent} = \frac{9·85 \times 0·02805 \times 10^3}{1·4605} = 189·2$$

2 1·906 gm. oil were saponified as above with 40 c. c. alcoholic potash.

$$40 \text{ c. c. KOH} = 31.9 \text{ c. c. } \frac{N}{2} \text{ HCl}$$

Excess of alkali = 18·8 ,, ,,

$$\text{Saponification equivalent} = \frac{13·1 \times 0·02805 \times 10^3}{1·906} = 192·8$$

3 2·184 gm oil were treated as above with 40 c. c. alcoholic potash solution.

$$40 \text{ c. c. KOH} = 31·8 \text{ c. c. } \frac{N}{2} \text{ HCl (Blank experiment)}$$

Excess of alkali = 17·0 ,, ,,

$$\text{Saponification equivalent} = \frac{14·8 \times 0·02805 \times 10^3}{2·184} = 190·0$$

The determinations described above were made in November 1891, when the oil was fresh It was preserved in a stoppered bottle and a year after (November 1892) the saponification equivalent was found to be 191·6.

The saponification number for niger-seed oil may be taken as 190

SAPONIFICATION EQUIVALENT FOR COCOANUT OIL.

The sample was obtained from Viper Island, Port Blair, and was guaranteed to be a "standard sample."

1. 1·275 gm oil were treated with 20 c. c. alcoholic solution and heated to boiling on the water-bath as in the previous cases.

$$20 \text{ c. c. KOH} = 30·45 \text{ c. c. } \frac{N}{2} \text{ HCl (Blank experiment)}$$

Excess of alkali = 18·75 ,, ,,

$$\text{Saponification equivalent} = \frac{11·7 \times 0·02805 \times 10^3}{1·275} = 257·4$$

2. 1·24 gm. oil were treated with 20 c. c. alcoholic potash as above

$$20 \text{ c. c. KOH} = 30{\cdot}4 \text{ c. c } \frac{N}{2} \text{ HCl (Blank experiment)}$$

Excess of alkali = 19·0 „ „

$$\text{Saponification equivalent} - \frac{11{\cdot}4 \times 0{\cdot}02805 + 10^3}{1{\cdot}24} = 257{\cdot}8$$

3. 1·038 gm. oil with 20 c. c. alcoholic potash solution.

$$20 \text{ c. c. KOH} = 20{\cdot}4 \text{ c. c. } \frac{N}{2} \text{ HCl}$$

Excess of alkali = 10·8 „ „

$$\text{Saponification equivalent} = \frac{9{\cdot}6 \times 0{\cdot}2805 \times 10^3}{1{\cdot}038} = 259{\cdot}4$$

The saponification equivalent for cocoanut oil is thus found to lie between 257—260.

SAPONIFICATION EQUIVALENT OF PURE FRESH GHEE (CLARIFIED BUTTER).

1. 13·525 gm. ghee were heated in a water-oven and then kept inside a desiccator for a week. The ghee was then found to weigh 13·5 gm. It would thus appear that ghee is not hygroscopic; nor does it contain any moisture.

1. 1·8196 gm. ghee were treated with 20 c. c. alcoholic potash solution. Details as in the previous cases.

$$20 \text{ c. c. KOH} = 31{\cdot}0 \text{ c. c. } \frac{N}{2} \text{ HCl (Blank titration)}$$

Excess of alkali = 16·55 „ „

$$\text{Saponification equivalent} = \frac{14{\cdot}45 \times 0{\cdot}02805 \times 10^3}{1{\cdot}8196} = 222{\cdot}7$$

2. 2·0776 gm. ghee saponified with 20 c. c. alcoholic potash solution.

$$20 \text{ c. c. KOH} = 30{\cdot}8 \text{ c. c. } \frac{N}{2} \text{ HCl (Blank titration)}$$

Excess of alkali = 14·5 „ „

$$\text{Saponification equivalent} = \frac{16{\cdot}3 \times 0{\cdot}02805 \times 10^3}{2{\cdot}0776} = 220{\cdot}07$$

3. The same ghee re-melted and filtered. There was no residue on the filter.

1·294 gm. saponified with 20 c. c. alcoholic potash.

$$20 \text{ c. c. KOH} = 30{\cdot}9 \text{ c. c.} = \frac{N}{2} \text{ HCl (Blank titration)}$$

Excess of alkali = 21·45 „ „

$$\text{Saponification equivalent} = \frac{9{\cdot}45 \times 0{\cdot}02805 \times 10^3}{1{\cdot}204} = 220{\cdot}1$$

ANOTHER SAMPLE OF GHEE.

1 1·547 gm were treated with 20 c. c. alcoholic potash, the mouth of the flask was closed with a cork to which was attached a long glass tube, which acted as a reflex condenser.

$$20 \text{ c. c. KOH} = 16·5 \text{ c. c. } \frac{N}{2} \text{ HCl (Blank tit.)}$$

$$\text{Excess of alkali} = 4·5 \text{ ,,}$$

$$\text{Saponification equivalent} = \frac{12 \times 0·02805 \times 10^3}{1·547} = 217·6$$

2. 1·1512 gm ghee treated with 30 c. c. potash.

$$30 \text{ c. c. KOH} = 25 \text{ c. c. } \frac{N}{2} \text{ HCl (Blank tit.)}$$

$$\text{Excess of alkali} = 16·0 \text{ ,, ,,}$$

$$\text{Saponification equivalent} = \frac{9 \times 0·02805 \times 10^3}{1·1512} = 219·2$$

SAPONIFICATION EQUIVALENT FOR MOWA "BUTTER"

Oil of *Bassia latifolia*—(Nat. order—Sapotaceæ.)

This substance by its physical characters, *e. g.*, color, consistency, melting point, &c., much resembles ghee, and is therefore frequently used for its falsification.

1 1·396 gm oil were placed in a stout 12oz bottle, together with 40 c. c. alcoholic potash solution. The mouth of the bottle was closed with a India-rubber cork, fastened by means of wire. It was then kept immersed in boiling water, with occasional shaking.

40 c. c. alcoholic potash were also heated under exactly the same conditions—

$$40 \text{ c. c. KOH} = 31·6 \text{ c. c. } \frac{N}{2} \text{ HCl (Blank exp.)}$$

$$\text{Excess of alkali} = 21·6 \text{ ,, ,,}$$

$$\text{Saponification equivalent} = \frac{10 \times 0·02805 \times 10^3}{1·396} = 200·9$$

2 2·086 gm oil heated under pressure just as above—

$$20 \text{ c. c. KOH} = 29·3 \text{ c. c. } \frac{N}{2} \text{ HCl (Blank.)}$$

$$\text{Excess of alkali} = 14·6 \text{ ,, ,,}$$

$$\text{Saponification equivalent} = \frac{14·7 \times 0·02805 \times 10^3}{2·086} = 197·6$$

The soap solutions were perfectly clear and colourless.

To ensure complete saponification it is preferable to treat Mowa oil under pressure as above. If the oil be simply heated on a water-bath, with a watch-glass at the mouth of the flask, the soap solution is sometimes found to have a turbid appearance, and the Saponification equivalent comes out rather low

SAPONIFICATION-NUMBER FOR MUTTON-FAT.

The fat was melted over a water-bath and filtered to get rid of the shreds of membrane, &c.

1. 1·3906 gm. of fat were treated with 20 c. c. alcoholic potash and heated over a water-bath for 15 minutes

20 c c. KOH = 16·2 c c. $\frac{N}{2}$ HCl (Blank.).

Excess of „ = 6·0 „ „

$$\text{Saponification equivalent} = \frac{0·02805 \times 10·2 \times 10^3}{1·3906} = 205·7$$

2. 0·9318 gm. of the same sample treated with 20 c. c. alcoholic potash, &c.

20 c. c. KOH = 16·15 c c. $\frac{N}{2}$ HCl (Blank.)

Excess of „ = 9·3 „ „

$$\text{Saponification equivalent} = \frac{0·02805 \times 6·85 \times 10^3}{0·9318} = 206·2$$

ANOTHER SAMPLE OF MUTTON-FAT.

0·8354 gm was treated with 20 c. c KOH

20 c. c. KOH = 16·15 c. c. $\frac{N}{2}$ HCl (Blank.)

Excess of „ = 10·2 „ „

$$\text{Saponification equivalent} = \frac{5·95 \times 0·02805 \times 10^3}{0·8354} = 199·8$$

Duplicate analysis of the same sample gave the number as 199·2

SAPONIFICATION EQUIVALENT OF OIL OF SESAME.*

Sesamum indicum (Nat Order Pedaliaceæ.)

1. 1·6835 gm. oil were heated over a water-bath with 20 c. c alcoholic potash solution for 15 minutes

2. 1·3145 gm. oil were heated as above with 30 c. c. alcoholic potash solution.

20 c. c. KOH = 16·2 c. c. $\frac{N}{2}$ HCl (Blank.)

. 30 c. c. „ = 24·3 „ „

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* The oil was extracted by means of carbon bisulphide

$4{\cdot}8$ c. c. $\frac{N}{2}$ HCl were required by (1) for the excess of alkali

$15{\cdot}4$ „ „ „ „ (2) „ „ „

Saponification equivalent of $(1) = \frac{11{\cdot}4 \times 0{\cdot}02805 \times 10^3}{1{\cdot}6835} = 190{\cdot}0$

Do do. $(1) = \frac{8{\cdot}9 \times 0{\cdot}02805 \times 10^3}{1{\cdot}3145} = 189{\cdot}9$

SAPONIFICATION EQUIVALENT OF LARD *

1. $1{\cdot}4245$ gm. lard were heated over a water-bath with 20 c. c. alcoholic potash solution.

2. $1{\cdot}432$ gm. lard heated as above with 30 c. c. alcoholic potash solution—

20 c. c. KOH $= 15{\cdot}8$ c. c. $\frac{N}{2}$ HCl

30 „ $= 23{\cdot}7$ „ „

(1) Consumed $5{\cdot}9$ c. c. $\frac{N}{2}$ HCl for the excess of alkali.

(2) „ $13{\cdot}7$ „ „ „ „

Saponification equivalent for $(1) = \frac{9{\cdot}9 \times 0{\cdot}02805 \times 10^3}{1{\cdot}4245} = 194{\cdot}9$

„ „ „ $(2) = \frac{10 \times 0{\cdot}02805 \times 10^3}{1{\cdot}432} = 195{\cdot}9$

Mean of two $= 195{\cdot}4$

ESTIMATION OF GLYCERIN ACCORDING TO FOX AND WANKLYN'S METHOD, AS IMPROVED BY BENEDIKT AND ZSIGMONDY.

In view of the contradictory statements which have appeared from time to time as regards the applicability of this process, a few preliminary experiments were undertaken with the object of testing its trustworthiness —

(*a*) A solution of pure oxalic acid was divided into two equal portions The oxalic acid was thrown down by means of calcium acetate in presence of acetic acid. The oxalate precipitate was in one case dissolved in hot hydrochloric acid, the solution diluted with water and further acidified with sulphuric acid, warmed to about 60°, and titrated against accurately standardised permanganate solution. In another case the oxalate precipitate was converted by ignition into lime.

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* The lard was a standard sample and was not taken off any particular part of the pig's carcass.

$\left(1 \text{ c. c. } \frac{N}{10} \text{ KMn O}_4 = 0·0028 \text{ gm. CaO}\right)$. The two results were found to be thoroughly concordant.

(b) Oxidation of glycerin to oxalic acid:—

1. 5·62 gm. of glycerin were weighed into a flask and diluted to 500 c. c. with water. 25 c. c. of the solution were oxidised to oxalic acid.*

25 c. c. sol. $= \frac{5·62}{20}$ gm. glycerin $= 0·281$ gm. glycerin on the supposition that the sample contained cent per cent. of glycerin.

The potassium oxalate solution was made up to 500 c. c. of which 100 c. c. gave 0·028 gm. CaO (by ignition)

or 500 c. c. $K\bar{O}$ Sol. $= 0·028 \times 5$ gm. CaO $= 0·02 \times 5$ Ca

But 0·002 gm. Ca $= 0·0046$ gm. glycerin

∴ 0·02 gm. Ca $= 0·046$ gm. glycerin

or $(0·02 \times 5)$ gm. Ca $= 0·046 \times 5$ gm. glycerin $= 0·23$ gm. glycerin

The Sample thus contained $100 \times \frac{0·23}{0·281}$ or 81·8 $^\circ/_0$ of glycerin.

2. 5·895 gm. glycerin (the same sample) were dissolved in water and diluted to 500 c. c., of which 25 c. c. were oxidised to oxalic acid.

25 c. c. sol. $= \frac{5·895}{20}$ gm. $= 0·2947$ gm. glycerin.

The oxalate solution was made up to 500 c. c., of which 100 c. c. yielded 0·0285 gm. CaO $= 0·02035$ gm. Ca.

But 1 c. c. $\frac{N}{10}$ $KMnO_4$ $= 0·002$ Ca from CaC_2O_4

$= 0·0046$ gm. glycerin

∴ 0·02035 gm. Ca $= 0·046805$ gm. glyc.

or 500 c. c. oxalate sol. $= (0·046805 \times 5)$ gm. glyc.

$= 0·234$ gm. glyc.

The sample thus contained $100 \times \frac{0·234}{0·2947}$ or 79·75 $^\circ/_0$ glycerin.

The mean of the above two determinations may be taken as 80 $^\circ/_0$ approximately.

SAPONIFICATION OF MUSTARD OIL

(Estimation of glycerin.)

1. 8·65 gm. oil were saponified according to Allen's method.† The soap solution was treated with dilute sulphuric acid, the beaker in

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* An abstract of Benedikt and Zsigmondy's method will be found in *Journ. Soc. Chem. Ind.* IV, 610.

† The use of alcoholic potash is highly objectionable; "pure methyl alcohol" is difficult to procure. "Hence," as Allen remarks, "I have latterly aimed at

which it was contained was immersed in ice-cold water to completely solidify the separated fatty acids. The glycerin solution was then filtered off and made up to 250 c.c. of which 20 c.c. were each time oxidised to oxalic acid. The oxalic acid was thrown down by calcium acetate. The precipitate of $Ca\bar{O}$ was dissolved in HCl, further acidified with H_2SO_4, and titrated with $N/10\ KMnO_4$. The strength of the permanganate solution was ascertained each time by titration against re-crystallised oxalic acid and sometimes against ferrous ammonic sulphate.

7·5 c.c. $N/10\ KMnO_4$ were used up by the oxalic acid solution.

1 c.c. $N/10\ KMnO_4 = 0·0063$ gm. $\bar{O} = 0·0046$ gm. glycerin, hence amount of glycerin in 20 c.c. sol.

$$=0·0046 \times 7·5 \text{ gm.}$$

Total glycerin in 250 c.c.

$$=(0·0046 \times 7·5) \times \frac{250}{20} \text{ gm.}$$

$$=0·431 \text{ gm.}$$

Per cent of glycerin in the oil = 4·98

But the $N/10\ KMnO_4 = 0·0061$ gm. $\bar{O}$ instead of 0·0063 gm. $\bar{O}$.

Per cent of glycerin in the oil = 4·82

2. 8·48 gm. oil were saponified just as above. The glycerin solution made up to 250 c.c., of which 50 c.c. were oxidised to oxalic acid.

The oxalate solution was divided into two equal portions, one-half (*a*) (= 25 c.c. glyc. sol.) was acidified with H_2SO_4, heated to boiling and titrated, the other half (*b*) was treated with $Ca\bar{A}c$, and the precipitated $Ca\bar{O}$ dissolved in dilute H_2SO_4 and then titrated with $\frac{N}{10}\ KMnO_4$.

(*a*) Required 17·0 c. c. $\frac{N}{10}\ KMnO_4$

(*b*) „ 15·0 „ „

1 c. c. $\frac{N}{10}\ KMnO_4 = 0·0046$ gm. glyc.

15 c. c. $\frac{N}{10}$ „ $= 0·0046 \times 15$ gm. glyc. $= 0·069$ gm. glyc.

250 c. c. glyc. solution contains 0·69 gm. glycerin.

Per cent. of glycerin in the oil = 8·14.

Experience has shewn that the oxalate solution if titrated direct, after addition of H_2SO_4, gives the result too high. Precipitation of the

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effecting saponification by aqueous alkali, and thus completely avoiding the source of error in question." *Jour. Soc. Chem. Ind.* V 70; also Sutton's Volumetric Analysis, 6th ed. p. 345

oxalate as CaO cannot be dispensed with. These experiences are in conformity with those of Allen and Belcher. Two more saponifications carried on as above yielded the percentage of glycerin as 5·3 and 6·0 respectively.

AN IMPROVED METHOD OF SAPONIFICATION

It is thus evident that the saponification was by no means complete, as the percentage of glycerin ranged between 8·14 and 4·8 Allen's method had thus to be abandoned. It was, in fact, noticed that the oily layer invariably floated over the solution of caustic potash and that shaking simply brought about a momentary incorporation of the oil and alkali The two layers separated as soon as the bottle was placed in the boiling water This difficulty was obviated by the introduction into the bottle of asbestos wool, thoroughly ignited previously to get rid of accidental organic impurities. This absorbing medium brought the oil and the alkali into intimate contact with each other and thus complete saponification was ensured The heating was done just as in the previous cases, *i. e.*, by immersion in boiling water

1 1·573 gm oil were treated as above, the fatty acids liberated by means of dilute H_2SO_4 and filtered off. The mass of asbestos, which had become slimy by the absorption of the fatty acids was then thrown on the filter-paper and repeatedly exhausted with hot water Scarcely a trace of the fatty acids was found to pass through the filter-paper.* The filtration was carried on with the aid of a Bunsen's pump

The glycerin solution was made up to 250 c. c., of which 100 c c. were oxidised to oxalic acid The latter thrown down as CaO. The CaO dissolved in dilute H_2SO_4 and the solution made up to 250 c c, of which

100 c.c. reqd. 4·7 c. c $\frac{N}{10}$ $KMnO_4$

or 250 „ „ 11·75 „ „ (= 100 c. c glycerin sol)

∴ 250 c. c. glycerin solution = 29·37 c c $\frac{N}{10}$ $KMnO_4$

and 1 c c $\frac{N}{10}$ $KMnO_4$ = 0·0046 gm glyc.

∴ 29·37 „ „ = 0·135102 gm glyc.

or 1·573 gm. oil yielded 0·135102 gm. glyc.

whence glycerin °/₀ = 8·6

2. 2·167 gram oil were saponified as above

The glycerin solution made up to 250 c. c. of which 100 c. c.

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* The filtered solution of glycerin was sometimes perfectly clear, sometimes slightly opalescent.

oxidised to Ō, precipitated as CaŌ, &c., and titrated = 16·0 c. c. $\frac{N}{10}$ $KMnO_4$

whence percentage of glycerin = 8·45

3. 1·99 gm. oil saponified as above. Details exactly the same as in the preceding.

250 c. c. glycerin solution = 35 c. c. $\frac{N}{10}$ $KMnO_4$

glycerin $^{0}/_{0}$ = 8·1

4. 1·3165 gm. oil saponified according to the improved method. Details the same as in the previous cases—

250 c. c. glycerin sol. = 25·0 c. c. $\frac{N}{10}$ $KMnO_4$

= 0·115 gm. glycerin

glycerin $^{0}/_{0}$ = 8·7.

The permanganate solution on direct titration against ferrous ammonium sulphate gave

1 c. c. = 5·6 (1 − 0·02) mgs Fe.

Whence glycerin per cent (corrected) = 8·7 (1 − 0·02)

= 8·53

5. 2·0365 gm. oil saponified: details the same—

250 c. c. glyc. sol. = 37·5 $\frac{N}{10}$ $KMnO_4$

Glycerin per cent = 8·33 (corrected).

6. 1·264 gm. oil saponified as above.

250 c. c. glycerin solution = 23·75 c. c. $\frac{N}{10}$ $KMnO_4$

Whence glycerin per cent = 8·64.

It would thus be safe to take the percentage of glycerin in mustard oil as 8·5. The oil used was not in every case identical, but from different samples, in fact, the same as used in the determination of the saponification equivalent.

DETERMINATION OF GLYCERIN IN MUTTON-FAT BY THE ASBESTOS METHOD.

1. 1·0425 gm. fat were saponified under pressure as in the case of mustard oil.

The glycerin solution was made up to 500 c. c. of which 100 c. c. were oxidised to Ō. The CaŌ was dissolved in dilute H_2SO_4 and made up to 250 c. c.; 50 c. c. of the latter were equivalent to 1 c. c. $\frac{N}{10}$ $KMnO_4$

or 250 CaŌ sol. = 100 c. c. glyc. sol. = 5 c. c. $\frac{N}{10}$ $KMnO_4$

or 250 c. c. glycerin solution = 25 c. c. $\frac{N}{10}$ $KMnO_4$

and 1 c. c. $\frac{N}{10}$ $KMnO_4$ = 0·0046 gm. glycerin

Total amount of glycerin = 0·0046 × 25 gm. = 0 115 gm.

whence percentage = 11 03.

But, 1 c c. $\frac{N}{10}$ $KMnO_4$ when titrated against pure oxalic acid was found to be equal to, 1 c c $\frac{N}{10}$ $KMnO_4$ (1 − 0·02)

∴ per cent of glycerin (corrected) = 11·03 (1 − 0·02)

= 10·81.

2. 1 8877 gm fat were saponified as above, the heating was continued for 6 days on an average of $3\frac{1}{2}$ hours each day.

The filtrate* (= glycerin solution) was made up to 500 c. c. of which 50 c. c. were oxidised to $K\bar{O}$, &c

The $Ca\bar{O}$ sol was made up to 250 c. c. of which 100 c. c. required

1·7 c. c. $\frac{N}{10}$ $KMnO_4$

∴ 250 c. c. $Ca\bar{O}$ sol. = $\left(1{\cdot}7 \times \frac{5}{2}\right)$ c. c. $\frac{N}{10}$ $KMnO_4$

or 50 c. c. glyc. sol. = 4·25 c. c. $\frac{N}{10}$ $KMnO_4$

or 500 " " " = 42·5 " " "

whence percentage of glycerin = 10 36

per cent corrected = 10 36 (1 − 0·02) = 10·16

Theoretical percentage of glycerin in mutton-fat, calculated as tri-stearin = 10 33.

DETERMINATION OF GLYCERIN IN NIGER-SEED OIL.

1. 3 165 gm oil were treated with potash solution and asbestos, &c., as in the case of mustard oil.

The glycerin solution was made up to 250 c. c. of which 50 c. c. were oxidised to $\bar{O}$, and the $Ca\bar{O}$ sol also made up to 250 c. c—

50 c c. $Ca\bar{O}$ sol. = 3 c. c. $\frac{N}{10}$ $KMnO_4$

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* The filtrate in the above cases was very faintly milky. It was therefore surrounded by ice-cold water to solidify, if possible, minute traces of fatty acids which might have remained in suspension. The opalescence, however, could not be got rid of. On standing for 3 to 4 days the solution kept in a stoppered flask became clear, but was at the same time the *nidus* of a kind of fungoid growth, resembling flakes of cotton-wool

$\therefore$ 250 c. c. CaO sol. $= 15$ c. c. $\frac{N}{10} KMnO_4$
or 50 glycerin solution $= 15$ „ „ „
or 250 „ „ $= 75$ „ „ „

But 1 c. c. $\frac{N}{10} KMnO_4$ $= 0·0046$ gm. glycerin.

$$\text{Percentage of glycerin} = \frac{75 \times 0·0046 \times 10^2}{3·165} = 10·9.$$

2. 1·704 gm. oil were treated exactly as above, the glycerin solution made up to 500 c. c. of which 100 c. c. were oxidised to oxalic acid. The CaO dissolved in dilute H_2SO_4 was made up to 250 c. c.

50 c. c. CaO sol. $= 1·6$ c. c. $\frac{N}{10} KMnO_4$
250 c. c. „ „ $= 8·0$ „ „ „
or 100 c. c. glycerin sol. $= 8·0$ „ „ „
$\therefore$ 500 „ „ „ $= 40·0$ „ „ „

$$\text{Percentage of glycerin} = \frac{40 \times 0·0046 \times 10^2}{1·704} = 10·8.$$

The percentage of glycerin in niger-seed oil is thus practically the same as in mutton-fat.

ESTIMATION OF GLYCERIN IN BUTTER-FAT

The oxidation of glycerin by the alkaline permanganate is not applicable in the case of butter-fat, as the soluble fatty acids, *e. g.*, butyric, caproic, &c., it contains yield notable quantities of oxalic acid under the same treatment. The same remarks apply to the case of cocoanut oil (See *Chem. News*, Vol. LXIII, p. 251).

NOTE ON THE FOX AND WANKLYN METHOD OF ESTIMATING GLYCERIN

This method, although it yields accurate results, can scarcely be made use of by the ordinary commercial analysist on account of its tedious and troublesome nature. Moreover, the manganese precipitate, sometimes bulky, cannot be properly washed without the aid of a Bunsen's filter-pump. The details recorded above will show that each determination of glycerin involves steady work of several hours. If ordinary alcohol be used as a solvent for the fats and oils, saponification is easily effected, but there is considerable risk of the loss of glycerin during the evaporation of alcohol.

ON THE LOSS OF GLYCERIN BY VOLATILISATION.

2·165 gm glycerin were diluted with water to 250 c. c.; 50 c. c. were each time mixed with 25 c. c. pure alcohol, the latter evaporated off on a water-bath in—

(1) A platinum basin of 3 in. diameter.
(2) A porcelain basin of 5 in diameter
(3) Do do of about 3 in. diameter.

In (1) and (2) the percentage of glycerin was found to be 74·0; in (3) the percentage was 77·8 The percentage as found before (see p 69) should have been 80

It is thus evident that during the evaporation of alcohol considerable quantities of glycerin are carried off.

IODINE ABSORPTION FOR FATS AND OILS †

COCOANUT OIL.

The sample was the same as used for the determination of the saponification equivalent.

1 1·3585 gm. oil were digested for 24 hours with 10 c. c chloroform and 20 c c iodine solution In this as well as in the subsequent analyses a blank experiment was each time made side by side, and under exactly similar conditions, to determine the strength of the iodine solution. The time allowed for digestion was from 18 to 24 hours.

20 c. c. iod sol + 10 c. c $CHCl_3$ = 35·0 c. c. $Na_2S_2O_3$ (Blank exp)
Excess of iodine = 27·5 ,, ,,
Diff. = 7·5 ,, ,,

7·5 c. c $Na_2S_2O_3$ represent the amount of iodine absorbed by the oil.
But 1 c c. $Na_2S_2O_3$ = 0·01265 gm iodine.
Hence amount of iodine consumed by 100 gm. oil, "iodine degree,"

$$=\frac{0\cdot01265\times7\cdot5\times100}{1\cdot3585}=6\cdot99$$

But the actual strength of the thiosulphate solution, as checked by titration against pure iodine, was found to be equal to 0·01265 (1 − 0·03) gm. per 1 c. c.

Corrected iodine number = 6·99 (1 − 0·03) = 6·78

2. 1·459 gm. oil were digested as before.

26·5 cc $Na_2S_2O_3$ sol. were taken up by the excess of iodine, and
20 c. c. iod. sol = 35·0 c. c $Na_2S_2O_3$

$$\text{Iodine degree} =\frac{0\cdot01265\times8\cdot5\times100}{1\cdot459}=7\cdot37$$

Corrected number = 7·37 (1 − 0·03) = 7·15

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† For details of Hübl's method, see *Journ Soc, Chem. Ind* iii, 612 also Allen's *Org. Analysis.*

3. 1·016 gm. oil were digested for 24 hours with 20 c. c. 1 and 10 c. c. CHCl$_3$

20c. c. 1 + 10 c c. CHCl$_3$ = 16 0c. c. Na$_2$S$_2$O$_3$ (Blank exp.)

Excess of iodine = 10 4 „ „

Dif. 5·6 „ „

$$\text{Iodine degree} = \frac{0{\cdot}01265 \times 5\ 6 \times 100}{1{\cdot}016} = 6{\cdot}97$$

Corrected number = 6 97 (1 − 0·03) = 6·76.

4. 1·984 gm. oil were digested with 30 c c. iod. sol. and 10 c c CHCl$_3$. Excess of iodine = 13 c c. Na$_2$S$_2$O$_3$

30c. c. iod. sol. + 10c. c. CHCl$_3$ = 24c. c. Na$_2$S$_2$O$_3$ (Blank exp.)

$$\text{Iodine degree} = \frac{0\ 01265 \times 11 = 100}{1\ 984} = 7\ 01$$

Corrected number = 7 01 (1 − 0 03) = 6·81

GHEE (CLARIFIED BUTTER)

1. 0·955 gm. ghee was digested for 24 hours with 10 c. c. CHCl$_3$ and 20 c. c. iod sol.

10 c. c. CHCl$_3$ + 20 c. c. iod. sol. = 32 8 c. c. Na$_2$S$_2$O$_3$

Excess of iodine = 6 3 „ „

Dif. = 26·5

$$\text{Iodine degree} = \frac{0{\cdot}01265 \times 100 \times 26\ 5}{0\ 955} = 35{\cdot}1$$

2 0·216 gm. ghee was digested as above

27 0 c. c. Na$_2$S$_2$O$_3$ was taken up by the excess of iodine.

$$\text{Iodine degree} = \frac{0\ 1265 \times 5{\cdot}8 \times 100}{0\ 216} = 33{\cdot}9$$

Mean of the two determinations = 34·5

Corrected number = 34 5 (1 − 0 03) = 33 5

The saponification equivalent of this sample of ghee was found to be 221 (See p. 65).

ANOTHER SAMPLE OF GHEE.

1. 0 355 gm. was digested with 20 c c. iod. sol. and 10 c. c. CHCl$_3$. 10·3c. c. Na$_2$S$_2$O$_3$ were required for the excess of iodine.

20 c. c. iod. sol. + 10 c. c. CHCl$_3$ = 22 6 c. c Na$_2$S$_2$O$_3$

$$\text{Iodine degree} = \frac{12\ 3 \times 0\ 01265 \times 100}{0\ 355} = 43\ 8$$

2. 0 303 gm. substance was treated with 20 c. c. iod. sol. and 10c. c. CHCl$_3$; 12·1 c c Na$_2$S$_2$O$_3$ sol. were taken up by the excess of iodine.

$$\text{Iodine degree} = \frac{10\ 5 \times 0{\cdot}01265 \times 100}{0{\cdot}303} = 43{\cdot}8$$

Mean of the above two determinations = 43·8

But 1 c. c. $N_2S_2O_3$ was-equal to (1 − 0·1) gm. iodine.

Corrected number = 39·4

The saponification equivalent for this sample of ghee was 218 (p. 66).

IODINE DEGREE FOR MUSTARD OIL

(1) 0·140 gm oil was digested for about 24 hours with 20 c c. iod sol. and 10 c. c chloroform.

(2) 0·202 gm. oil was digested for the same length of time with 30 c. c. iod. sol. and 10 c c. $CHCl_3$

20 c. c. iod. sol. + 10 c. c $CHCl_3$ = 27·5 c c. $Na_2S_2O_3$ (Blank exp.)
30 „ „ „ = 41·25 c. c. „
(1) required 16·6 c. c $Na_2S_2O_3$ for the excess of iodine
(2) „ 25·4 „ „ „ „ „ „ „
Amount of iodine consumed by (1) is equivalent to 10·9 c c $Na_2S_2O_3$
„ „ „ (2) „ „ „ 15·85 c. c „

Iodine degree for (1) $= \dfrac{0{\cdot}01265 \times 10{\cdot}9 \times 100}{{\cdot}14} = 98{\cdot}5$

„ „ (2) $= \dfrac{0{\cdot}01265 \times 15{\cdot}85 \times 100}{0{\cdot}202} = 98{\cdot}5$

But 1 c. c $Na_2S_2O_3$ = 1 c. c I $\times \dfrac{10}{10{\cdot}2}$ (as found by actual titration with pure iodine)

Iodine degree (corrected) = 96·9 or 97·0

IODINE DEGREE FOR NIGER-SEED OIL

(1) 0·137 gm. oil was digested with 30 c.c iod sol and 10 c c chloroform.
(2) 0·171 „ „ „ 40 „ „ „ „
(3) 0·098 „ „ „ 30 „ „ „ „
30 c. c. I + 10 c. c. $CHCl_3$ = 45·2 c c. $Na_2S_2O_3$ (Blank exp.)
Whence also
40 „ „ „ = 60·26 „ „
(1) Required 32·0 c. c $Na_2S_2O_3$ for the excess of iodine.
(2) „ 43·4 „ „ „ „ „
(3) „ 35·6 „ „ „ „ „

Iodine degree for (1) $= \dfrac{0{\cdot}01265 \times 13{\cdot}2 \times 100}{0{\cdot}137} = 121{\cdot}8$

„ „ (2) $= \dfrac{0{\cdot}01265 \times 16{\cdot}86 \times 100}{{\cdot}171} = 124{\cdot}7$

„ „ (3) $= \dfrac{0{\cdot}01265 \times 9{\cdot}6 \times 100}{0{\cdot}098} = 123{\cdot}9$

The *mean* of the three numbers is 123·5

But 1 c. c. $Na_2S_2O_3$ = 1 c. c $\frac{N}{10}I \times \frac{10}{10\cdot3}$

Hence the iodine degree (corrected) = 120

IODINE DEGREE FOR EARTH-NUT OIL.*

(1) 0·181 gm oil was digested with 20 c. c. iod. sol. and 10 c. c $CHCl_3$.

20 c. c. I + 10 c c. $CHCl_3$ = 20·8 c c $Na_2S_2O_3$ (Blank titration)

4·7 c c. $Na_2S_2O_3$ were required for the excess of iodine

Iodine degree $= \frac{16\cdot1 \times 0\cdot01265 \times 100}{0\cdot181} = 112\cdot5$

But 1 c c. $Na_2S_2O_3$ = 1 c. c. $\frac{N}{10} I \times \frac{10}{11\cdot5}$

Corrected number $= 112\cdot0 \times \frac{10}{11\cdot5} = 97\cdot5$

(2) 0·1645 gm. oil was treated with 30 c. c. iod. sol and 10 c c. chloroform.

(3) 0·1535 ,, ,, ,, 30 ,, ,, ,, ,,

(2) Required 15·0 c. c $Na_2S_2O_3$ for the excess of iodine

(3) ,, 16·0 ,, ,, ,, ,, ,,

The iodine degree for (1) = 103·8

,, ,, ,, (2) = 103·0

Mean of two determinations = 103·4

But 1 c.c. $Na_2S_2O_3$ = 1 c. c. $\frac{N}{10} I \times \frac{10}{10\cdot5}$

Hence corrected number $= 103\cdot4 \times \frac{10}{10\cdot5} = 98\cdot5$

MOWA FAT.

(1) 0·1815 gm. oil was treated with 10 c c. $CHCl_3$ and 20 c.c. iod. sol.

(2) 0·186 ,, ,, ,, and 30 c c. ,, ,,

11·5 c c. $Na_2S_2O_3$ were reqd. for the excess of iod. by (1)

21·5 ,, ,, ,, ,, ,, ,, (2)

20·0 c c. iod. sol. + 10 c. c $CHCl_3$ = 20·6 c. c. $Na_2S_2O_3$

30·0 ,, ,, ,, ,, = 30·9 ,, ,,

From which we get the iodine degree for

(1) as 63·42, and that for (2) as 63·88

Mean of two = 63·7

But 1 c. c. $Na_2S_2O_3$ = 1 c. c. $\frac{N}{10} I \times \frac{10}{10\cdot3}$

Corrected number $= 63\cdot7 \times \frac{10}{10\cdot3} = 61\cdot8$

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* The saponification equivalent of this sample was found to be 195·0.

IODINE DEGREE FOR SESAME' OIL.*

(November 29, 1893.)

(1) 0·2806 gm. oil was digested with 20c. c. iod. sol. and 10c. c $CHCl_3$.

5·9c. c. $Na_2S_2O_3$ were required for the excess of iodine.
20c. c. I = 29·8c. c. $Na_2S_2O_3$ (Blank exp.)

$$\text{Iodine degree} = \frac{23·9\times 0·01265\times 100}{0·2806} = 107·7$$

But 1c c. $Na_2S_2O_3$ had the actual strength 1c. c. × $(1-0·02)\ \frac{N}{10}$ I

Corrected number = 107·7 (1 − 0·02) = 105·5

(December 5, 1893.)

(2) 0·1721 gm. oil was digested with 20c. c I sol. and 10c. c $CHCl_3$
(3) 0·2065 „ „ „ „ „ „
(4) 0·227 „ „ „ „ „ „

20c. c I sol. + 10c. c. $CHCl_3$ = 25·5c c $\frac{N}{10}$ $Na_2S_2O_3$ (Blank titration)

No. (2) required 10·9c c. $Na_2S_2O_3$ for the excess of iodine.
No. (3) „ 8·2 „ „ „ „ „
No (4) „ 6·4 „ „ „ „ „

From which we get the iodine degree for

(2) = 10·73
(3) = 106·0 } mean = 106·6
(4) = 106·4

But 1c. c $Na_2S_2O_3$ = 1c c. I (1 − 0·02)
Corrected number = 106·6 (1 − 0·02) = 104·5.

IODINE DEGREE FOR LARD

(1) 0·2215 gm. lard was digested with 20c c I and 10c. c. $CHCl_3$
(2) 0·1995 „ „ „ „

15·1c. c. $Na_2S_2O_3$ were required by (1) for the excess of iodine
16·1 „ „ „ „ (2) „ „ „
20c c I + 10c c $CHCl_3$ = 24·1 c c. $Na_2S_2O_3$ (Blank exp.)

$$\text{Iodine degree for } (1) = \frac{9\times 0·01265\times 10^2}{0·2215} = 51·4$$

$$\text{„ „ } (2) = \frac{8\times 0·01265\times 10^2}{0·1995} = 50·7$$

Mean of the two determinations = 51·0

But 1c. c. $Na_2S_2O_3$ = 1c. c. $\frac{N}{10}$ I × (1 − 0·02)

Whence corrected number = 50·0

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* The oil was extracted from the seeds by means of carbon bisulphide, and it was the same as used for determining the saponification equivalent.

NOTE ON HÜBL'S IODINE ABSORPTION METHOD.

There is some difference of opinion as regards the excess of iodine, which should be present after its absorption. Thompson and Ballantyne, who have carefully revised the *constants* required in the analysis of some fats and oils, are of opinion that "at least double the amount of iodine absorbed should be present." Care was taken to fulfil this condition in most of the analyses as recorded above. On reference to sesamé and earth-nut oils, it would appear, however, that it is not always necessary that the iodine should be in large excess. Thus in one case the excess of iodine corresponds to only 5·9 c.c. N/10 $Na_2S_2O_3$ solution, and in another to only 4·7 c.c. $Na_2S_2O_3$, solution without the results being discordant.

For convenience of reference the results obtained above are presented below in a tabulated form —

Table of constants in the analysis of fats and oils

NATURE OF FAT OR OIL.	Saponification equivalent	Glycerin per cent.	Iodine absorption.
Mustard oil	172–176	8·5	97·0
Niger-seed oil	190·0	10·8	120
Cocoanut oil	258·0	...	6·9
Ghee	218–222	...	33·5–39·4
Mowa fat	199·3	...	61·8
Mutton tallow	199·5–206	10·5	......
Sesamé . ..	189·9	...	104·5
Lard	195·4	...	50·0
Earth-nut oil	196·0	...	98·0

SUMMARY AND CONCLUSION.

It would thus appear that as the saponification equivalents of niger-seed oil, mowa fat, mutton tallow, sesamé oil, lard and earth-nut oil are very close to one another, their admixtures in considerable proportions cannot be detected by Koettstorfer's test. Even the saponification equivalent of ghee is not far removed from that of lard or tallow. The saponification equivalents of mustard oil and cocoanut oil are, however, highly characteristic. The iodine degrees, on the other hand, afford us valuable hints as to the nature of adulteration, the most remarkable feature being the exceedingly low numbers for cocoanut oil and ghee. The results of the application of Reichert's test will be communicated later on.

JOURNAL

OF THE

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cription of this species so as to make its recognition possible to those who—and all who can use the work should—take with them on their journey a copy of the *Flora of British India*. To the brief diagnosis, in which its place among the species described in that work is shown, a full botanical account is appended.

MECONOPSIS VIGUIER.

(*Flor. Brit. Ind.* i. 118)

* Scapes radical, one-flowered.

† *Leaves pinnatisect.*

1 * MECONOPSIS BELLA *Prain;* quite glabrous.

ALPINE HIMALAYA · Western Sikkim and Eastern Nepal; alt. 12–14,000 feet, *Dr King's collectors!*

Root stout, fusiform, neck clothed with sheaths. *Leaves* many, 2–4 in long, petioled, 2–3 jugately imparipinnatisect *Scapes* slender, numerous, glabrous. *Flowers* 2–3 in diam., pale blue *Petals* 4–5. *Ovary* globose, style short, stigmas 5. *Capsule* obovoid, $\frac{1}{2}$–$\frac{3}{4}$ in, seeds with lax reticulated testa

† † *Leaves subentire or entire.*

1. M. SIMPLICIFOLIA *H f & T.;* softly hairy.

2. M. HORRIDULA *H f & T.,* prickly.

* * Stems leafy Flowers racemed or panicled.

3. M. ACULEATA *Royle*, etc., as in "*F B I*"

MECONOPSIS BELLA *perennis*, glaberrima, *rhizomate* minimo digito crasso collo extruso et vaginis foliorum anni antecedentis vestito, *foliis* omnibus radicalibus longe petiolatis, glabris, petioli margine ad basin versus in vaginam membranaceam dilatato, lamina circumscriptione ovato-lanceolata, 2–3-jugim inparipinnatisecta, segmentis 3-partitis, lobulis ovato-obtusis, *scapis* numerosis gracilioribus, simplicibus, 1-floris, *floribus* majusculis coeruleis, sepalis 2, petalis 4–5, staminibus ∞ (circa 80), ovario ovato, placentis 4–5, stylo distincto, stigmate radiatim 4–5-lobo, *capsula* substipitata, obovoidea, seminibus numerosis testa laxa reticulatis et pseudostrophiolatis, embryone basilari parvo

In Himalaya orientali Sikkim, in tractu Jongri apud Pe-kiong-la, circa 12,000 p. s m., et in Nyegu ad fines Napaliæ orientales, 14,000 p. s m, *Kingii mercenar!* In mense Julio floret.

Rhizomate 12 cm. longo, hoc 1·5 cm crasso, parte subaërio plus quam 2 cm, foliorum, iis *Corydalis leptocarpæ* similium, petiolo 6–10 cm. longo, lamina 2·5 cm. longa hoc 1–1·5 cm lata, lobulis 5 mm longis his 3 mm latis, scapis 6–10 cm. longis, sepalis 12 mm. longis, his 8 mm. latis, ovatis, petalis 30 mm. longis, his 20 mm latis, ovato-rotundatis, staminibus filamentis filiformibus 6 mm. longis glabris, antheribus (e sp sicco aureis) 2·5 mm longis, vix 1 mm latis, oblongis; ovario 5 mm. longo, stylo 3 mm longo, capsula matura 15 mm. longa obpyriformi in stipite 4 mm longo attenuata, seminibus 1·25 mm. longis, 3 mm latis

Nulli speciei *Meconopsidis* adhuc descriptæ arcte affinis.

Noviciæ Indicæ VIII. *Some additional species of* Convolvulaceæ.—By D Prain.

[Received Mar. 31st;—Read April 4th]

It is now nearly eleven years since the account of the Indian species of this order by Mr. C B Clarke, was published (*Flora of British India*, iv, pp 179–228 June 1893) In this interval, some forms new to the area dealt with in the *Flora*, including a few that appear to be new to science, have been reported from various localities, chiefly, however, from British Indo-China, and from Malaya

Having been directed by Dr. King to re-arrange the Indian material of the order preserved in the Calcutta Herbarium, in such a manner as to incorporate the new material as nearly as possible on the lines of Mr. Clarke's account, the writer, while doing so, has drawn up, as he did in the case of the *Labiatæ*, descriptions of all the species, whether new to science or not, that are new to the Indian area, with a view to their presentation to the Society, in the hope that they may prove useful to members who require to use the *Flora of British India* in the field. As on former occasions, the descriptions have been made as nearly as possible in the style of those of the *Flora*

Of the majority of the forms which have been previously described, but which are now for the first time reported as Indian, and of all the forms that are now being described, as the writer believes, for the first time, examples have been sent by Dr. King, Superintendent of the Royal Botanic Garden, to Mr Dyer, Director of the Royal Gardens, Kew, for favour of comparison with the Indian material in the great national Herbarium there In this way it has been made certain that none of the species now described as new exist under older names in the two Herbaria of Kew and Calcutta, which are the most richly endowed with Indian specimens

The writer would wish to convey his thanks to Mr Dyer, the Director, and to Dr Stapf, the Assistant for India at Kew, who made the necessary comparisons, for their kindness in affording him the assurance required to render the validity of these species probable.

1. ERYCIBE Roxb.

1*b*. **Erycibe peguensis** *Prain.* Erycibe paniculata *Roxb.* var. peguensis. *Clarke, Flor. Brit. Ind.*, iv, 180. E glaucescens *Kurz, For. Flor Brit. Burma*, ii, 214 *in part, not of Wall*

Besides the points alluded to by Mr Clarke, this plant is distinguished from *E. paniculata* Roxb, by the much larger fruit and by the margin of the corolla, which is white, not yellow, being undulate only, not finely crenulate.

CHITTAGONG: common. ARRACAN; *Prain!* PEGU: *Kurz!* TENASSERIM, common. ANDAMANS, Coco Islands. *Prain!* South Andaman; common. NICOBARS; *Kurz!*

This plant appears to take the place of *E paniculata* throughout South-western Indo-China This constitutes, by his specimens, the major part of *E glaucescens* of Mr Kurz, in the *Forest Flora of British Burma.*

2. ERYCIBE EXPANSA *Wall*, Erycibe coriacea *Kurz*, *For. Flor Brit. Burma*, ii, 213 *in part not of Wall.*

Add to localities of *F B. I.* —MALAY PENINSULA; Kedah, *Curtis*, n. 2128!

Flowers pinkish white (*Curtis*)· There is no example of *Wall Cat* n 1337 (*Erycibe coriacea* Wall) at Calcutta, Mr Kurz has identified with that species both *Wall Cat* n 1331 (the type of *E expansa*) and Helfer 5879 (*E ferruginosa* Griff K D), hence the discrepancy between his description of *E coriacea*, and those of Choisy, and of the *F B I*

3 ERYCIBE SUBSPICATA *Wall.* Erycibe paniculata VAR subspicata, *Choisy*, *Ann Sc Nat* 2, i, 222 and *DC Prodr* ix, 464 Erycibe paniculata *Kurz*, *For Flor. Brit. Burma*, ii, 214, *hardly of Roxb.*

Add to localities of *F B I* —

BOOTAN, alt 2000 ft, *King's collector!* UPPER ASSAM, Akha Hills, *King's collector!* Golaghat district, *Jenkins!* *Mann!* TENASSERIM *Brandis!* *Parish* (Dr Stapf *in litt*)

This is certainly, as Choisy and Kurz indicate, and as Mr Clarke admits, very near *E paniculata* Roxb The writer, however, agrees with Mr Clarke in considering it quite distinct* The flowers and fruits in this species are larger than in *E paniculata*, the flowers being larger than even in *E peguensis* The lobules are more deeply erose than in *E paniculata*, much more so than in *E peguensis*

4b ERYCIBE ANGULATA *Prain*, branchlets angular pubescent, leaves obovate, base cuneate or rounded, apex shortly acuminate or rounded sometimes deeply emarginate, coriaceous, glabrous, lateral nerves visible above, distinctly raised beneath, cymes in axillary and terminal racemes. Erycibe paniculata *Miq*, *Flor. Ind Bat Suppl.* 248, *not of Roxb.*

MALAY PENINSULA; Perak, Larut, *Kunstler* n. 7379! Dijong, *Scortechini* n. 1816! DISTRIB Sumatra (*Teysmann* Hort Bog n. 3682!) Java (*Kurz!*)

A robust scandent shrub (*Scortechini*) or strong creeper ("over 100 feet," *Kunstler*) with stem 4–6 in diam, branches terete glabrous, ultimate branchlets angular rusty-pubescent. *Leaves* petioled 4–8 in. by 2–4 in, lateral veins 5–8 pairs, raised beneath as in *E glomerata* though not so prominently (and not as in that species impressed above) secondary veins indistinct, petioles ½ in, rusty puberulous *Cymes* with angular rachis clothed with dark red tomentum, axillary 1–6 in by 1–1½ in, terminal 7–10 in long, with at times floral leaves intermixed *Pedicels* ¼–⅓ in. *Sepals* orbicular, outer stellately rusty tomentose, inner ciliate *Corolla* white, lobes spreading ½ in, interlobular portion hirsute externally, lobules glabrous, ovato-oblong, margins slightly undulate. *Berry* not seen

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* Equally distinct appears to be a species collected in New Guinea by Hellwig (n. 87 ex *Mus Bot. Berol*) and by Forbes (n 439). This has flowers much as in *E paniculata*, but the racemes are shorter, the fruits smaller, and the leaves ovate-acute with rounded bases and petioles ⅓–½ in long, *much* smaller (1½–2½ in. by ¾–1 in.) and more thickly coriaceous. To this species the writer would give the name *Erycibe Hellwigii.* This has been issued as *E paniculata* from Berlin.

This very distinct species is the *Erycibe paniculata* of Miquel's Supplement from Sumatra, as the example of Teysmann's gathering from Danoh Tjaloh, Moerie, preserved in the Calcutta Herbarium, shows It also occurs in Java

6. ERYCIBE MALACCENSIS *Clarke*

Add to localities of *F B. I.* —

MALAY PENINSULA Perak, *Scortechini* 2196! *Kunstler* 3180! 3575! Penang, *Maingay* 1154!

Berry purple when mature. Corolla tube very much shorter than in *E paniculata*

7 ERYCIBE PRINCEI *Wall*

Add to localities of *F. B I.* —

SINGAPORE, *Kurz* ! *Hullett* ! Add to distribution, Sumatra (*Forbes* n. 1826!).

The plant that is known in the Buitenzorg garden as *Erycibe tomentosa* Bl is this species The *Hort. Bogor* identification is most probably accurate, in which case Blume's name (*Bijdr* 1048) will replace Wallich's more recent one.

8 ERYCIBE GRIFFITHII *Clarke*

Add to localities of *F. B I* —

PENANG *Gaudichaud* 120, *Curtis* 181! *Kunstler*, 1458!

Corolla waxy cream-yellow, lobes very narrow, spreading ¼ in, interlobular portion densely red-pubescent externally, lobules small, glabrous, narrowly oblong, obliquely cut, acute, divergent.

11. ERYCIBE GLOMERATA Wall.

A small tree, 10–20 feet high, with strong straggling shoots, flowers creamy yellow, "with strong odour of unripe turnips" (*Proudlock*) *Corolla* lobes broad, spreading ⅜ in; interlobular portion rusty pubescent externally, lobules ovate, margins erose throughout

The corolla is much like that of *E coriacea* VAR *fragrans*, but the lobules are broader and are erose instead of merely undulate

It is still doubtful if this be the same as Blume's *E. glomerata.* Miquel says it is not; but there is no example of Miquel's plant (*Zollinger* n 706) at Calcutta, nor is there any Java specimen here that will suit Miquel's description, or that will match with Wallich's plant. Blume's description is quite inadequate.

12. ERYCIBE AENEA *Prain*; branchlets round, densely rusty-tomentose, leaves quite glabrous, narrowly oblong or elliptic to an obtuse apex, base cuneate, very coriaceous, nerves impressed on both surfaces, cymes ¼–1¼ in, minutely closely rusty-tomentose.

MALAY PENINSULA: Perak, at 2,000—2,500 ft. elev., *Kunstler* n. 7337!

A very large climber, "100–150 ft. long, 2–3 in. diam." (*Kunstler*). *Leaves* 2½–5 in. by 1–2 in., shining, often blistered beneath, lateral nerves 5–6 pairs with a distinct marginal nerve, secondary veins also distinctly impressed especially beneath, petiole ⅛ in., or less. *Cymes* axillary 3–20 fld. peduncles and bracteolate pedicels (⅛ in. long) rusty close-pubescent. *Sepals* orbicular, closely brown-tomentose. *Corolla* lobes spreading ½ in., pale yellow, interlobular portion pale-brown tomentose externally, lobules ovate-oblong, margins undulate. *Berry* not seen.

Allied to *Erycibe coriacea*, but with smaller and more coriaceous leaves, and with flowers more like those of *E. glomerata*. The leaves when dry are of a coppery red colour.

3. ERYCIBE PRAECIPUA *Prain*; **branchlets round, quite glabrous, leaves very coriaceous, nerves obscure on both surfaces, long petioled, narrowly elliptic, attenuated to both ends, apex obtuse, cymes axillary, small lax few-fld.**

PENANG: Government Hill, *Curtis* n. 911! 1273!

A large climbing shrub, branches round. *Leaves* 1½–3 in. by ¾–1½ in., all nerves quite obscure, petiole ⅓ in., glabrous. *Cymes* ½ in. 5–8-fld., minutely adpressed pilose, pedicels bracteolate, ⅛ in. *Sepals* orbicular, outer minutely, inner densely, closely rusty pubescent. *Corolla* lobes very narrow, spreading ½ in., interlobular portion rufous pubescent internally and externally, lobules small, glabrous, narrowly oblong, subacute divergent. *Berry* coriaceous rough, ovoid, ¾ in. long ⅝ in. across, pointed.

This species is not easily differentiated from *Erycibe Maingayi*—of which there is no specimen at Calcutta—by the somewhat incomplete diagnosis of the *F. B. I.* All the characters given for *E. Maingayi* apply to *E. praecipua*, except the explicit one of 'hairy innovations' and the implication that its secondary nerves are distinct. *E. Maingayi* is, however, said to appear to be allied to *E. Princei*—an alliance by no means marked in *E. praecipua*. This, coupled with the fact that *E. praecipua* has been distributed by Mr. Curtis as *E. coriacea*, and that Dr. Stapf informs him that the plant has been associated (though not identified) with *E. coriacea* at Kew, assures the writer that it is distinct from *E. Maingayi*.

E. coriacea is a species founded on *Wall. Cat.* n. 1337, from Chittagong, a plant that has apparently been lost. It was seen and described by Choisy (*Ann. Sc. Nat.* 2, i, 224), but it is not present now in the Wallichian type Herbarium, or in the Herbaria at Kew and at Calcutta. But Choisy considered *E. fragrans*, Wall. (*Cat.* n. 1336) conspecific with *E. coriacea*, whence we may infer that the flowers of *E. fragrans* are similar to, if not identical with, those of *E. coriacea*.

In *E. praecipua* the corolla lobes are long and narrow, with small divergent auriculate lobules, as in *E. Griffithii*, and to a less degree in *E. Stapfiana*, while the interlobular portion of the corolla lobes are densely pubescent within as well as without. In *E. fragrans* the lobes are short and wide with large ovate over-lapping lobules, the interlobular part of the lobes being glabrous within as in every other species of *Erycibe* in the Calcutta Herbarium except *E. praecipua*.

Had this character been present in the lost *E. coriacea*, Choisy would never have united with it Wallich's *E. fragrans*; unless the same character is present in the corolla of *E. Maingayi* (which has not as yet been described), this alone should be sufficient to distinguish *E. praecipua* from all the hitherto described species of *Erycibe*.

14. Erycibe Stapfiana *Prain;* branchlets round glabrous, leaves large usually elliptic or oblong, narrowed to a cuneate or narrowly truncate base, apex shortly blunt acuminate, sometimes narrowly lanceolate, coriaceous, glabrous paler beneath; lateral nerves raised beneath, cymes in axillary clusters,

Malay Peninsula Perak; at considerable elevations, 300–3000 feet, *Kunstler*, 4015 4115 ! 7784 ! *Scortechini*, 1793 ! Tenasserim *Parish !*

A shrubby or slender climber, much branched. *Leaves* 4–7 by 2–3 in. oblong or elliptic in all the Perak specimens, narrow lanceolate $4\frac{1}{2}$ by $1\frac{1}{4}$ in in Tenasserim ones, lateral nerves 4–6 pairs, obliquely ascending (the lowest pairs extending more than $\frac{1}{2}$-way along the margin) visible above and raised beneath, secondary veins reticulately raised beneath inconspicuous above, petiole $\frac{1}{4}$ in glabrous. *Cymes* $\frac{1}{2}$–2 in long, in fascicles of 4–9, from an axillary woody protuberance, 5–20-fld, peduncles densely dark brown tomentose as are the bracteolate pedicels $\frac{1}{12}$–$\frac{1}{8}$ in *Sepals* orbicular densely brown-tomentose. *Corolla* lobes narrow, spreading $\frac{1}{2}$ in, waxy white within, interlobular portion very dark-brown tomentose externally, lobules narrow divergent, slightly crenulate along the obliquely truncate apex *Berry* ovoid, $\frac{2}{3}$ in long, $\frac{1}{2}$ in diam, densely clothed with a fine dark-brown velvety tomentum

A remarkable species, well characterised by its leaves, which bear a striking superficial resemblance to those of *Casearia macrocarpa*, and by its velvety epicarp.

15. Erycibe festiva *Prain*, branchlets angular, sparingly pubescent, leaves rather long petioled large thinly coriaceous glabrous, elliptic or oblong, base cuneate, apex long acuminate, lateral nerves distinct on both surfaces, especially beneath, cymes very short, few-fld.

Malay Peninsula Singapore, *Hullett* n. 624 ! Perak, *Kunstler* n 6445 !

A small tree (*Hullett*) or creeper, 60–70 feet long (*Kunstler*) branches grooved or angular *Leaves* 3-6 in by $1\frac{1}{2}$–$2\frac{1}{2}$ in. dark green, lateral nerves 7–9 pairs, secondary veins invisible, petioles $\frac{1}{2}$–$\frac{3}{4}$ in. *Cymes* axillary many-fld, peduncles $\frac{1}{3}$–$\frac{1}{2}$ in, rusty pubescent, pedicels bracteolate rusty pubescent $\frac{1}{8}$ in *Sepals* rusty pubescent orbicular *Corolla* lobes broad, spreading $\frac{3}{4}$ in, pale greenish white, interlobular portion brown tomentose externally, lobules ovate, margins deeply erose throughout *Berry* not seen

Resembles most closely *E. albida*, but differs very markedly in tomentum, in size of flowers and in shape of corolla lobules A very distinct species.

16 Erycibe albida *Prain*; branchlets round sparingly pubescent leaves very large elliptic or narrow oblong shortly attenuated at both ends, coriaceous glabrous pale beneath, lateral nerves visible but not raised on both surfaces, cymes very short, few-fld, flowers large.

Malay Peninsula · Perak, *Kunstler* n. 7373 ! *Scortechini*. Pungah, *Curtis* n 2947 !

A shrub (*Scortechini*, *Curtis*) or small tree (*Kunstler*) 10–20 feet high, erect, much spreading *Leaves* 7–12 in by 3–5 in, dark green above waxy pale greenish yellow beneath (*Kunstler*); lateral nerves 8–9 pairs, secondary veins invisible, petiole $\frac{1}{4}$–$\frac{1}{3}$ in. *Cymes* axillary 5–8-fld, peduncles $\frac{1}{10}$ in., flowers nearly sessile with 3 slightly rusty pubescent bracteoles at the base of the calyx. *Sepals* subglabrous pale waxy green (*Kunstler*) orbicular, margins ciliate. *Corolla* lobes narrow, spreading 1¼ in. white; interlobular portion rufous externally, lobules oblong obtuse slightly crenulate at the apex. *Berry* not seen

The very large leaves pale beneath, the large flowers with nearly glabrous calyx and the erect habit render this species very distinct from any of the others here described.

2 RIVEA Choisy.

1. Rivea ornata *Choisy, Convolv. Or.* 27, t 3 and *DC Prodr.* ix, 326, *Sweet, Hort Brit*, ed iii, 481, *Wight in Calc. Journ Nat. Hist.* viii, 179, t 5, f. 1, *Ill.* t. 168 *bis*, f, 1, and *Ic. Pl* t. 1356; *Dalz. & Gibs*, *Bomb. Fl* 168.

var typica *Clarke, Flor Ind.* iv, 183 (*excl syn. Roxb*, *Wall*, *Ham. Sweet* and *Brand*) Convolvulus candicans *Roth*, *Nov Sp* 106, *Roem. & Schult., Syst.* iv, 273 and 790 (*not of Soland.* [*Ipomœa fastigiata*], *nor of Rottl*, *Willd*, *Wall. and Roem. & Schult*, *l. c.* 302 [*Rivea hypocrateriformis*]). Lettsomia ornata, *Wall in Roxb Flor Ind*, ed *Carey & Wall* ii, 86 *in foot-note* (*not of Roxb*) A shrub with climbing stems and orbicular-cordate leaves, densely silky tomentose beneath, acute sepals and mostly 3-fld peduncles

Deccan Peninsula common in dry jungles, &c Ceylon, in the hotter parts of the island

There is nothing to add to Mr Clarke's excellent description of this plant, which, as he remarks, appears strictly confined to South India and Ceylon.

Var Griffithii *Clarke, Flor Brit Ind* iv, 183 An erect stout shrub with branches at length twining, leaves reniform, rarely orbicular-cordate sparsely grey-hirsute beneath, sepals obtuse, peduncles mostly 7-fld Lettsomia ornata *Roxb Hort Beng* 13, *Flor Ind.*, ed. *Carey & Wall* ii, 86 (*text*) and *Flor. Ind.* i, 496. Argyreia ornata *Sweet, Hort Brit* ed ii, 373, *Brandis, For Flor* 343.

Sub-Himalayan region, from the Sivaliks to the Sikkim Terai · common Sivaliks *Falconer* ! *Gamble* ! Dehra Dun *Vicary* ! Nepal Terai *Wallich* 1369/1 ! Sikkim Terai at Jhenaikuri, at Tukria Jhar, and in the Sivoke Sal Forest, *Gamble.*

A complete account of the synonymy is given here as it is almost certain that these two plants, first clearly differentiated by Mr Clarke, are really specifically distinct. The specimens in Griffith's Herbarium are from the Roxburghian plants of the Calcutta Botanic Garden Roxburgh originally got the seeds from General Hardwicke who collected largely in the Western Himalayas and along their base, but did not, so far as can be ascertained, collect in Southern India In any case the plant figured by Roxburgh in his *Ic Ined*,* and described by him, is *not* the South Indian but the Sub Himalayan plant It is to the latter that Roxburgh's trivial name of 'ornata' ought therefore rightly to belong; but as its application to Roth's *Convolulus candicans* has now become stereotyped, it will be necessary to allow the name *Rivea ornata* Choisy, to continue to designate the plant from Southern India, and be preferable to name the North-Indian one *Rivea Roxburghii*. *Convolulus Tarita* Ham (*Wall Cat* n 2258) is not at Calcutta; the plant was collected at Monghir if it really be this species, it is probably not from a wild plant, the only *Rivea* reported, since Dr. Buchanan-Hamilton's time, from the Monghir Hills is *R. hypocrateriformis*, which is common throughout Behar

13. ARGYREIA LOUR.

3 *b* ARGYREIA VENUSTA *Choisy*, *Convolv.* *Or.* 36, and *DC. Prodr.* ix., 330, leaves ovate cordate, obtuse or acute, glabrous above grey tomentose beneath, corymbs peduncled dense, bracts narrow oblong-obtuse with a few ovate-acute larger intermixed, and usually one or two foliaceous large ones at base of corymb, corolla sparingly hairy without, berry brownish, fruiting sepals lanceolate-reflexed Argyreia argentea VAR. venusta *Clarke*, *Flor Brit Ind* iv., 185 Argyreia zeylanica VAR. hirsuta *Kurz*, *For. Flor. Brit. Burma*, ii, 215 Convolvulus festivus *Wall Cat.* n 1414 (*not* Argyreia festiva *Wall*, *Pl. As Par*).

BENGAL: Faridpur, *Clarke*. BURMA Pegu, *McLelland*, *R Scott!* Ava, *Wallich!* Mandalay, etc, *King's Collectors!* common.

A large climber. *Leaves* usually 3–4 in diam (lower leaves sometimes as much as 7 in, diam) quite glabrous above at all stages, petiole 2½–4 in long *Peduncles* 2–4 in, *corymbs* rather large, bracts usually ¾ in by ⅙ in *Corolla* 1½ in to 1¾ in long, tubular funnel-shaped, 1¼ in wide at mouth; white or pale purple. *Berry* ⅓ in diam, globose, very hard and tough, sepals ultimately exceeding ½ in, in fruit coriaceous deflexed

A very distinct species, easily differentiated from *A argentea*, with which Choisy and Clarke have associated it, by its leaves glabrous above, its totally different tomentum on the leaves beneath, its longer, narrower, more reflexed sepals, and its smaller hard fruit

5. ARGYREIA HOOKERI *Clarke* Add to synonyms of *F. B. I.*:— Argyreia zeylanica VAR populifolia *Kurz*, *For Flor. Brit Burma* ii., 215. Lettsomia? Kurzii *Clarke*, *Flor Brit Ind* iv., 196

Add to localities —

NEPAL · *Scully!* ASSAM Goalpara, *King's Collectors!* BURMA · Chin Hills, *Prazer!* Pegu, *Kurz!* ANDAMANS Coco group, common, *Prain!* South Andaman, common, *E. H. Man!* *King's Collectors!*

6. ARGYREIA SPLENDENS *Sweet.*

Add to localities of *F. B I*:—

NAGA HILLS *Clarke*, *Collett!*

7. ARGYREIA CHAMPIONI *Benth*, *Fl Hong-kong*, 236 (1861). A obtecta, *Clarke*, *Flor. Brit. Ind.* iv. 186 (1883). Convolvulus obtectus *Wall. Cat*, 1416. Rivea? obtecta *Choisy*, *Convolv. Or* 28 and *DC. Prodr.* ix., 326. Lettsomia Championi *Bth. & Hook. f*, *Gen. Pl.* ii., 869.

VAR. typica. Add to localities of *F. B. I.*:—

BURMA Karen Hills, *Mason*! Shan Hills *Collett*! Pegu Yomah, *Kurz*! ANDAMANS: Coco group, *Prain*! MALAY PENINSULA: Perak, *Scortechini*! DISTRIB China.

VAR. obtusifolia Add to localities:—

ANDAMANS Port Blair, very common; *E. H. Man*! *King's Collectors*!

This species, nearest to *A. splendens*, is well distinguished by the marks indicated by Mr Clarke

The two varieties are perhaps hardly separable, the original specimens of *A. Championi*, from Hongkong, which is not separable from Wallich's *Convolvulus obtectus*, being intermediate as to form of leaves between the two The leaves in the first variety (which includes here all forms with acute leaf-apices) vary in size from 3 by 1½ in (in Wallich's), or 3 by 2 in (in Bentham's) original specimens, to 8 by 3½ in in some of Kurz's (from the lower part of the plant) in Pegu specimens, and in shape from elliptic-oblong (which is usual) to sublanceolate in some from Tenasserim (*Gallatly*, 557) and Kedah (*Curtis*, 2582) In Gallatly's specimens, however, leaves of the usual type occur on the same branch with the narrow ones referred to The base, moreover, which is usually cuneate is sometimes rounded, especially in the Pegu, the Karen, and some of the Tenasserim specimens, but the same branches bear leaves of the ordinary type Similarly, in the Andamans, branches of VAR *obtusifolia* (which here includes the forms with apices of leaves obtuse) bear at the same time some leaves with acute tips

Both varieties vary in degree of tomentum, especially on the upper surface those from Pegu, the Karen Hills, the Coco-group, and some, but not all, from Tenasserim and the Andamans being glabrous above, the others (including both Wallich's & Bentham's types) are sparsely hirsute The tomentum beneath is usually brown, but is grey in the Hong-Kong plant, and in that from the Pegu Yomah. This closely resembles in flowering calyx and in foliage *Argyreia? mollis* Choisy, from Java, and from Sumatra (Teysmann, n 4332, Hort Bogor) which has, however, a very different calyx (sepals sub-connivent) in fruit.

22. ARGYREIA DALTONI *Clarke.*

Add to localities of *F B. I* —

MADRAS PRESY: Ganjam, at Kukubalu, alt. 500 ft, and in Rampa State, alt. 2000 ft, *Gamble*, n 13766, 15995!

3*b*. BLINKWORTHIA CHOISY.

Erect or scandent or trailing shrubs with slender branches *Leaves* oblong or elliptic sparsely strigose beneath *Flowers* axillary solitary involucrate, pedicels short, usually four-bracteate, bracts small coriaceous. *Sepals* sub-orbicular sub-equal coriaceous, slightly accrescent. *Corolla* campanulate waxy-white, limb very slightly lobed. *Stamens* included; anthers oblong. *Ovary* 2-celled, surrounded by a prominent tubular disc; locules 2-ovuled, style filiform, stigmas 2, sessile globose. *Fruit* indehiscent, baccate, 4–1 seeded.—Species 2, Indo-Chinese.

1. BLINKWORTHIA LYCIOIDES *Choisy, Convolv. Or.* 48, t. 5 and *DC.*

Prodr. ix, 354, erect, branches numerous slender, short, rigid, flowers longer than the leaves, bracts narrowly oblong, pedicels very short. *Coll. & Hemsl.*, *Journ. Linn Soc.* xxviii., 94, t 15 Convolvulus lycioides, *Wall Cat* 1390.

BURMA · Kyauk-Taloong, *Wallich* ! Pegu Yomah, *Kurz* ! Meiktila, *Collett* ! Tagoung, Up-slay, *J Anderson* ! Pienmona, *King's Collectors* !

An erect bush, 6–10 feet, ultimate branches straight, virgate, 2–10 in ; *leaves* numerous ½–¾ in by ¼–⅓ in glabrous above sparingly hirsute beneath, as are the branches, peduncles and outside of the bracts, *peduncles* ¼ in., bracts ⅛ in long; pedicels 0–⅛ in *Sepals* ⅛ in (fruiting ¼ in) diam, glabrous, as are the pedicels. *Corolla* ¾ in, white *Berry* ¼ in diam

2. BLINKWORTHIA CONVOLVULOIDES *Prain* ; climbing or trailing, branches few slender long flexous, flowers shorter than the leaves, bracts ovate-oblong, pedicels distinct

BURMA Kendat *Prazer* ! Myingyan *Prazer* !

A climber, over 40 feet long (Kendat specn) or a prostrate creeper (Myingyan specn), ultimate branchlets 10–18 in , *leaves* sparse 1½–2 in, by ½–¾ in, glabrous above sparingly hirsute beneath, as are the branches, peduncles, and bracts externally, *peduncles* ¼–⅓ in. *Sepals* ¼ in diam (in fruit ⅓ in) glabrous, as are the pedicels *Corolla* ¾ in campanulate, white *Berry* ⅓ in diam

This has distinctly larger leaves, bracts, sepals and fruit than *B lycioides*, though the writer would not on these grounds alone claim for it the rank of a species The habit, however, is too digeverent to admit of its treatment as a mere variety. This is not a case of what is under ordinary circumstances an erect shrub becoming a climber under suitable conditions, the field-notes made by the Calcutta Garden collector show that even when deprived of support this remains a weak, slender, prostrate species

4. LETTSOMIA Roxb

The difference between *Argyreia* and *Lettsomia* consists in the ovary being completely 4 celled in the former, only 2-celled in the latter; not infrequently, however, a partial dissepiment is found at the base of the cell in *Lettsomia*, the fruits are in both genera indehiscent

In *Ipomoea* (§§ *Batatas* and *Quamoclit*) the ovary is, as in *Argyreia*, completely 4-celled; in *Ipomoea* (§§ *Calonyction*, *Aniseia*, and *Euipomoea*) the ovary, as in *Lettsomia*, is 2-celled, while in many of the species of *Euipomoea* the same partial dissepiment is found at the base of the cell If, therefore, *Ipomoea* is to retain within it those plants of both classes where the fruit is dehiscent it seems essential that the plants of both classes where the fruit is not dehiscent should be included in one widened genus *Argyreia.* Choisy in his monograph of *Convolvulaceae* (*DC Prodr* ix,), includes Roxburgh's *Lettsomia* in *Argyreia*, but breaks up *Ipomœa* into as many genera as there are now recognised sections Bentham and Hooker, (*Genera Plantarum*, ii) on the other hand, recognise, and it seems very justly so, a widened *Ipomoea* which includes all of these, but separate *Lettsomia* from *Argyreia.* The opinion that *Lettsomia* and *Argyreia* deserve to be re-united has been formally expressed by Collett and Hemsley (*Journ Linn Soc.* xxviii, 95) With that opinion the writer quite agrees. Whether it be accepted generally or not, it is certain that any system of arrangement of the *Convolvulaceæ* which recognises *Lettsomia* as a genus apart from *Argyreia*, must of logical necessity rehabilitate the various sections of *Ipomœa* as separate genera.

26 SUB-GENUS 1 EULETTSOMIA LAXIFLORA *Prain;* leaves cordate mucronulate sparsely adpressed-hirsute, ultimately glabrescent above, rather thinly grey-tomentose beneath, peduncles long round white, tomentose, corymbs many-fld. lax axillary or arranged in large terminal panicles; bracts small lanceolate obtuse deciduous, outer sepals ovate, inner lanceolate rather narrower, all externally densely patently grey-hirsute. Argyreia laxiflora *Prain Mss.*

UPPER BURMA · Ava, *Wallich* (*Cat* n. 1362 *in part*) ! Ngyah Kyun, *J Anderson* ! Chin Hills, *King's Collectors* ! Shan Hills, frequent, *King's Collectors !*

Scandent, branches closely white tomentose; leaves 1½–2½ in long, 1–1½ in across, petioles ½–1½ in, peduncles 2–4 in, corymbs 4–12-fld pedicels ¼–½ in; bracts ⅙ in *Sepals* ¼ in long, outer ⅓, inner ⅛ in wide *Corolla* ¾ in, narrowly tubular below campanulate above, purple, hirsute externally. *Stamens* exserted *Capsule* ⅓ in. red, as are the fruiting sepals within.

This species is a member of the group to which *Lettsomia aggregata* (*Argyreia aggregata*, Choisy), *L mysorensis*, and *L bella* belong The corolla is exactly like that of *L. aggregata*, the calyx is almost like that of *L bella* From the former it differs in having small bracts, from the latter in having long peduncles from both it is distinguished by its lax cymes From *L mysorensis* it is distinguished by its inner sepals being as long as the outer

3 LETTSOMIA BELLA *Clarke.*

Add to synonyms of *F B I* ·—

Argyreia tomentosa *Choisy* VAR cordata *Choisy, DC Prodr* ix, 333 Convulvulus multibracteatus *Wall* VAR *β* cordata *Wall Cat.* n 1408/*β* Convolvulus vestitus *Wall Cat.* n. 1411.

Add to localities of *F B I.* —

NEPAL *Wallich* ! GANJAM Baibali, *Gamble* !

4. LETTSOMIA BRACTEOSA *Clarke.*

Add to description of *F B. I* —

Corolla 1½ in long, campanulate, stamens included

Add to synonyms —

Argyreia tomentosa *Choisy, DC Prodr* ix, 333, (except as to the description of the corolla which refers to *Lettsomia aggregata* VAR. *osyrensis*). Convolvulus multibracteatus *Wall Cat.* n 1408/1 *in part*

Of two gatherings issued under this name by Wallich, one is this species, the other is *Lettsomia aggregata* var. *osyrensis.*

7. LETTSOMIA HIRSUTISSIMA *Clarke.*

VAR. typica; leaves rather widely ovate-cordate, bracts oblong. Add to localities of *F. B. I.*:—

UPPER BURMA: Myingin, *Prazer!*

VAR. Collettii *Prain;* leaves narrower, bracts lanceolate. L. strigosa *Coll. & Hemsl.*, *Journ. Linn. Soc.* xxviii, 95, *not of Roxb.*

UPPER BURMA: Shan Hills at Fort Stedman, *Collett* n. 5! *King's Collectors!* Maymyo, *King's Collectors!*

This differs from the type in the leaves, which more resemble those of *L. setosa;* and in the bracts, which are quite unlike those of true *L. hirsutissima*. The inflorescence, calyx and corolla are quite like those of the true plant, but the corolla is reported in the Maymyo gathering to be white; that of true *L. hirsutissima* is said by Prazer to be purple. It is not impossible that this may ultimately prove to be specifically distinct.

What appears to be a third variety of this species is reported (but in fruit only) by our native collectors from the Ruby Mines District. The bracts in this plant are as in VAR. *typica*, but the tomentum is as in *L. setosa*.

8. LETTSOMIA STRIGOSA *Roxb.*, *Flor. Ind.*, ed. *Carey & Wall.* ii, 80 (1824), *not of Hort. Beng.* 13; *Clarke, Flor. Brit. Ind.* iv, 193 (*excluding the Java plant and the synonym* L. capitata *Miq.*). Argyreia capitata *Arn.*, ex *Choisy*, *Convolv. Or.* 41 [1834], and *DC. Prodr.* ix, 332 (*in part*), *Kurz, For. Flor. Brit. Burma*, ii, 216 (*in part*). Ipomoea capitata *Roem. & Schult. Syst.* iv., 238 [1819], *not of Choisy.* Convolvulus capitatus *Vahl, Symb.* iii, 28 [1794]. C. capitiformis *Poiret* in *Lamk. Encyc. Meth.*, *Suppl.* iii, 469. C. strigosus *Wall. Cat.* 1365/1, 1365/D, 1365/E partly.

Add to localities of *F. B. I.*:—

CHITTAGONG: Kodala Hill, etc., common, *King's Collectors!* BURMA: Arracan, at Sandoway, *Maicgraie!* Pegu, *Kurz!* Shan Hills, common, *King's Collectors!* ANDAMANS: Coco Islands, *Prain!* DISTRIB. Yunnan (*J. Anderson!*)

Though less common in Indo-China than the plant described by Mr. Clarke as *L. peguensis*, this is widely spread throughout Upper Burma; it does not appear to extend to Tenasserim where its place is taken by *L. peguensis*. This forms part of Kurz's *Argyreia capitata*—which is thus co-extensive with Choisy's, but it is not Miquel's *Lettsomia capitata* which is founded on a Java plant collected by Horsfield that, so far as the Calcutta specimen goes, is undoubtedly *L. peguensis* Clarke.

There is no doubt, from the description given by its author, that this is *Convolvulus capitatus* Vahl. Dr Wallich, himself one of the editors of the first edition of Roxburgh's *Flora Indica*, admits that this, though the *Lettsomia strigosa* of that work, is *not* the *Lettsomia strigosa* of the *Hortus Bengalensis*, which was issued (*Cat.* n. 1404/1) as *Convolvulus barbiger* Wall.; unfortunately Wallich associated with this a different plant (or rather a mixture of two) from Burma (*Cat.* n. 1404/2). One of these Choisy has made the type of his *Argyreia barbigera* (*Lettsomia barbigera* Clarke) the other has dropped out of notice as completely as has the plant that Wallich really intended by *Convolvulus barbiger*.

9 **Lettsomia peguensis** *Clarke, Flor. Brit. Ind*, iv, 193 [1883] L strigosa *Roxb Hort. Beng.*, 13 [1814] ex *Wall in Cat Lith sub* n. 1404. L. capitata *Miq*, *Flor Ind. Bat*, ii., 591 [1856] Argyreia capitata *Choisy, DC Prodr.* ix 332 [1845] (*in part and excluding* var. β conferta), *Kurz, For. Flor. Brit. Burma* ii, 216 (*chiefly*) Convolvulus strigosus *Wall., Cat* 1365/2, 1365/C, 1365/E partly Convolvulus barbiger *Wall*, *Cat.* 1404/1, 1404/2 *in part only* Argyreia barbigera, *Choisy*, *Convolv. Or.* 42 and *DC. Prodr.* ix., 332, *Brand For Flor.* 343

Add to localities of *F B. I* :—

Malay Peninsula · Perak, common, *Scortechini* n 1628! Kunstler n. 2622! 8627! Distrib. Java.

Much confusion has been caused owing to Dr Wallich having in the first place mixed in his distribution of *Lettsomia strigosa* (*Cat* n 1365) that species and *L peguensis*, and again in his differentiation of *L peguensis* (*Cat* n 1404) having included with it another species whose presence has helped to obscure the identity of this.

When the somewhat tangled synonymy is unravelled, we find that what constitutes the *Lettsomia strigosa* of the *F B I* is really without a name, while the plant that Mr. Clarke has there for the first time satisfactorily differentiated is already provided with two names in the genus *Lettsomia*

The name *Lettsomia strigosa* was in reality first applied to what is in the *F B I* named *L peguensis*, a plant which, at the time the name was applied to it by Roxburgh, was being cultivated in the Calcutta Garden from seed received from "the Straits" But to re transfer the name to that species now (though doubtless the act will commend itself to pedantic purists in nomenclature) and to coin a new name for *L. strigosa* as limited in the *F B I*, would—in view of the fact that Roxburgh under the name has written a careful description which can only apply to the "*F B I*" *L. strigosa*—be, in the writer's opinion, not only unnecessary but reprehensible The name *L strigosa* is better kept for the original *Convolvulus capitatus* of Vahl, even though we know that its first application was to *L peguensis*. The name *L capitata* at all events is not available since that name was employed by Miquel to designate precisely the plant that is *not* Vahl's *Convolvulus capitatus*. At the same time it does not seem necessary to replace the name *L peguensis* by Miquel's one of *L capitata*, though it is older by nearly 30 years than Mr Clarke's one and though we know that it applies precisely to *L peguensis*. For it has to be recollected that *L capitata* Miq is *not* the same as *Convolvulus capitatus* Vahl, and therefore is not equivalent to *Argyreia capitata* Arn —the name that will have to be applied to *Lettsomia strigosa* of the *F B I* when *Lettsomia* is once more merged in *Argyreia*, and that though it is *included* in *Argyreia capitata* as that species has been understood by Choisy and by Kurz, it is not *equivalent to* the species of these two authors

When *Lettsomia* is again merged in *Argyreia* the *Lettsomia peguensis* of the *F. B I.* (L strigosa, *Roxb*, *Hort Beng* not *Flor Ind*) must—as will be shown in the writer's note on the next species—be known as *Argyreia barbigera* Choisy.

The further question whether these two plants are really specifically (they certainly are at least varietally) distinct is one that cannot be raised here, it can only be properly discussed by a monographer of the combined genera, though it is the writer's opinion that they should be reunited

10. LETTSOMIA BARBIGERA *Clarke, Flor. Brit. Ind.* iv, 194, *excluding all the synonyms.*

The writer has failed to discover what this species, which is not represented in the Calcutta Herbarium, really is. The localities given are "ASSAM; *Jenkins*," and "BRITISH BURMA. Prome, *Wallich*." To these Mr. Clarke has since added MANIPUR (*Journ. Linn. Soc.* xxvi, 49). The last mentioned gathering is not represented here; all of Capt. Jenkins' "Assam" specimens at Calcutta are referable to other species, the plant collected by Wallich at Prome and issued as part of *Cat.* n. 1404 belongs to a species which, Dr. Stapf informs the writer, is not Mr. Clarke's *Lettsomia barbigera* as represented in the Herbarium at Kew.

Wallich's *Convolvulus barbiger* (*Cat.* n. 1404) consists of two parts, *viz.*, 1404/1, a plant cultivated in the Botanic Garden at Calcutta and stated expressly by Wallich to be *Lettsomia strigosa* Roxb. of the *Hortus Bengalensis* as opposed to the plant so named in the *Flora Indica*, and 1404/2, made up of two gatherings from Burma, the first from the Irrawaday Delta, the second from Prome. Of the three gatherings which therefore go to make up *Convolvulus barbiger* Wall. the *F. B. I.* formally excludes two and retains only the one from Prome. *Cat.* n. 1404 is therefore only quoted *in part*. The part which is quoted is *not* the first sheet, which (in the event of any confusion having occurred) must be taken as the type, and indeed only forms a portion of the remainder. As it is specifically distinct from the type of *C. barbiger* that name must therefore be excluded entirely from the synonymy.

It is not *Pharbitis barbigera* Don (*Gen. Syst.* iv, 262) at all. That plant is a native of North America and is a true *Ipomoea*.

Not being *Convolvulus barbiger* of Wallich, it cannot be *Argyreia barbigera* of Choisy, for though that author somewhat unaccountably ignores altogether *Wall. Cat.* 1404/1, which is the true type of Wallich's plant, he has written a description that applies only to the gathering of 1404/2 from the Irrawaday Delta which is the same as 1404/1 and which is, therefore, as explained in the note under the preceding species, precisely = *Lettsomia peguensis* Clarke.

Choisy was not unaware of the fact that the remaining gathering of 1404/2 differed from the one to which his description alone applies. He speaks of it as a variety (though he does not distinguish it by name) with "leaves hardly cordate, peduncles short and few-fld., and leaves, at least when adult, less tomentose."

The citation of *Pharbitis barbigera* Don as a synonym originated with Choisy; who errs also in speaking of the species as coming from "Prome ad aestuar. Irrawady" whereas Wallich explicitly says in his *Catalogue* "Aestuar. Irrawadi, et Prome," Choisy's citation of locality therefore reads as if he supposed that Prome was situated in the delta of the Irrawady. At all events it does not make the fact clear that Wallich has two gatherings under 1404/2, still less that these gatherings represented two different species.

Since Wallich's time the Prome plant referred to above has been collected on the Pegu Yomah by Kurz, and more recently still in Upper Burma and the Shan Hills by native collectors sent from the Calcutta garden. One of these latter specimens which Dr. Stapf has kindly compared with the Kew material of *Lettsomia barbigera* Clarke, he has been able to assure us differs from that species. Since, therefore, one part of Wallich's *Cat.* n. 1404 agrees with Mr. Clarke's plant, it is evident that Dr. Wallich must have issued three things under that number, *viz.* 1. *Lettsomia peguensis* = 1404/1 and 1404/2, (*in part*), 2. *Lettsomia barbigera* = some part of 1404/2, from Burma, and by Mr. Clarke's citation, some part of the Prome gathering thereof; and 3. *Lettsomia confusa* = 1404/2 from Prome as represented at Calcutta—part of the species now to be described.

10 *b*. **Lettsomia confusa** *Prain*, leaves ovate acute, base subcordate or truncate, sparingly hirsute to nearly glabrous on both surfaces, peduncles short, 1–3-fld, bracts ¼–⅓ in. oblong obtuse adpressedly strigose deciduous, sepals ovate-obtuse or sub-acute, longer than the bracts, densely adpressedly strigose Argyreia confusa *Prain*

VAR. typica, peduncles glabrous usually capitately 3-fld., nearly as long as the glabrous petioles

BURMA. Shan Hills, *King's Collectors*! Makhoye Hill, *King's Collectors*!

VAR. brevipes *Prain*, peduncles puberulous usually 1-fld, much shorter than the pubescent petioles

BURMA Prome Hills, *Wallich* (*Cat* n 1404/2 in part in Herb. Calcutta)! Pegu Yomah, in Eng forests, *Kurz* n 1087!

A slender climber with glabrous branches *Leaves* long petioled 1–3 in by ½–2½ in, acute or acuminate, petioles slender, in VAR *typica* 2–2½ in long, in VAR *brevipes* 1–2 (sometimes even 4) in. long *Peduncles* very slender, in VAR typica 2 in in VAR *brevipes* 0–½ in; bracts herbaceous ⅛ in across pedicels 0–⅛ in *Sepals* ½ in, coriaceous, enlarging in fruit, accrescent *Corolla* 1½ in externally setose, white (*King's Collector*) or purple (*Kurz*) *Stamens* included *Fruit* globose, pink, ⅓ in diam. 4-seeded, pericarp thin, papery

A very distinct species with the facies of *Lettsomia setosa* VAR *minor*, but with a very different fruit which indicates a closer natural relationship to *L strigosa* than to *L setosa* That portion of *Convolvulus multibracteatus* Wall (*Cat* 1404) which is not *Lettsomia aggregata*, seems nearly related to VAR *brevipes*: it has a very similar corolla and fruit but the leaves are obtuse with rounded bases, and the bracts are very different, as is the shape of, and the tomentum on, the sepals If *Lettsomia bracteosa* is the same in reality as *Convolvulus multibracteatus* (*Argyreia tomentosa* Choisy), that species must be removed from the group of species with exserted stamens, and placed next to this plant.

12 *b*. **Lettsomia longifolia** *Coll. & Hemsl., Journ. Linn Soc.*, xxviii, 95; leaves narrowly oblong-lanceolate acuminate, base rounded or slightly cuneate, glabrous except the midrib above, sparsely strigose throughout beneath, heads few-fld., axillary shortly peduncled, bracts large oblong-lanceolate, persistent.

BURMA. Shan Hills, at 3000 feet, *Collett*! Maymo, *King's Collectors*! Makhoye, *King's Collectors*!

A large climber. *Leaves* 5–8 in by ¾ in, petiole ½–¾ in. *Peduncles* ¾–1 in, hirsute; bracts obtuse or subacute, reddish-purple, strigose beneath 1–1¼ in long *Sepals* equal oblong-orbicular, ⅓–½ in, coriaceous, dark red within, glabrous. *Corolla* 1¼ in glabrous externally, dark purple *Fruit* depressed, subglobose, dark red usually 2-seeded, ⅓ in. long, ½ in. diam

A very distinct species; most nearly allied to *Lettsomia atropurpurea*.

13. **Lettsomia sikkimensis** *Clarke, Flor Brit. Ind.* iv, 194. Argyreia elliptica *Choisy, DC Prodr.* ix., 330 (*in part, and as to the Burmese locality*). A zeylanica *Kurz* (*not of Gaertn.*) var. pedunculans *Kurz, For. Flor. Brit Burma,* ii, 215 Convolvulus pedunculans *Wall Cat*, 1417

Eastern Himalaya Sikkim, *Clarke* ! Akha Hills, *King's Collectors* ! Assam Naga Hills, *Masters* ! Khasia, *Hooker* ! Cachar, *Keenan* Burma Taong Doung, *Wallich* ! Ruby Mines, *King's Collectors* !

The chief distinction between *Lettsomia sikkimensis* and *Lettsomia elliptica* (*Argyreia elliptica* Choisy) is the size of the flowers and fruit Recent specimens of *L elliptica* show corollas nearly as long as in the Himalo-Burmese plant, the calyx and fruit however are always larger in the latter than in the Peninsular species Possibly Choisy is right in uniting the two, but they should at least be distinguished varietally in any case the species ought to be placed near each other

14 **Lettsomia rubens** *Clarke*, has been re-transferred to *Ipomoea*

14 *b*. **Lettsomia pallida** *Prain*, leaves ovate-oblong acute, or orbicular-ovate mucronulate, glabrous except for a few hairs on the midrib above, sparsely ashy-pubescent beneath as are the petioles, peduncles and branches, peduncles short, corymbs small few-fld, bracts minute caducous linear-oblong, sepals ¼ in outer orbicular inner broader than long, glabrous Argyreia pallida *Choisy, Convolv, Or* 34 and *DC Prodr* ix., 330, *Coll & Hemsl*, *Journ Linn Soc*, xxviii, 94 Convolvulus pallidus *Wall*, *Cat* 1418.

Burmah Between Yandabu and Paghanmyo, on the road to the Petroleum Wells, *Wallich* ! Mandalay, *J Anderson* ! Pwau-olwe, *Collett* ! Trongla, *King's Collectors* ! Shan Hills, at Meiktila, *Collett* ! *King's Collectors* !

A large handsome climber *Leaves* 2–3½ in by 1½–2½ in, base usually slightly cordate but often truncate, sometimes shortly cuneate, petioles ½–1¼ in *Peduncles* ¼–1 in, usually about ½ in, slender *Corymbs* 3–12 fld, bracts ⅛ in pubescent externally, early caducous, pedicels ¼ in or less, pubescent *Sepals* glabrous except along the margins even in bud, slightly accrescent, coriaceous *Corolla* ⅞ in long, ¾ in wide at mouth, campanulate, glabrous externally, white *Stamens* included, inserted near the base of corolla tube, filaments glabrous, anthers oblong, not twisted *Disc* prominent, *ovary* 2-celled, stigmas 2, subsessile globose. *Fruit* a hard brown indehiscent 2-seeded berry, depressed globose, ¼ in long, ⅜ in across, seeds 1 in each loculus, black, smooth

This species, not taken up in the *F B I*, is dealt with, in passing, in Sir Henry Collett's list of Shan Hill plants. More recent and very complete suites of specimens received from Dr King's native collectors from various parts of Upper-Burma render it possible to give a full description of the species and to show that while it really has an indehiscent fruit the ovary is only 2-celled As already said, the writer believes that *Lettsomia* must be again united to *Argyreia* when Choisy's name will once more be applicable In the meantime, and so long as generic rank is accorded to *Lettsomia* in India, it is necessary to indicate the fact that this is not a genuine 4-celled *Argyreia* The flowers a good deal resemble those of *Ipomoea staphylina,* which has, however, longer, many-fld corymbs, a dehiscent capsule and hairy seeds.

15 *b* LETTSOMIA MASTERSII *Prain,* leaves large ovate-cordate acute or acuminate, sparsely hirsute above densely or sparsely softly grey tomentose beneath, heads of many-fld dense dichotomous cymes shortly peduncled axillary, bracts long ligulate or lanceolate persistent Argyreia Mastersii *Prain Mss*

ASSAM Naga Hills, *Masters ! Collett !* Garo Hills, *King's Collectors !* BURMA Chin Hills, *King's Collectors !*

An extensive climber, stems, petioles and peduncles densely rusty-tomentose *Leaves* 4–10 in by 2½-7 in, towards ends of branches with base sometimes truncate not cordate, petiole ¾–1 in *Peduncle* ½–¾ in, bracts very many outer ligulate 1¼-1½ in long, ⅛–⅙ in wide throughout, sometimes one or two foliaceous near base of cyme, sparsely hirsute above densely tomentose beneath, and with longer spreading hairs along margins, inner lanceolate covered externally with spreading hairs *Sepals* ovate acuminate, ½ in (in fruit ¾ in) long, ¼ in across, glabrous within, clothed with long spreading hairs externally, firmly coriaceous *Corolla* (expanded not seen) in bud externally hirsute *Berry* ovoid, ⅓ in long ¼ in diam, dark-purple completely hidden within the conniving sepals

A very distinct species, nearest to *L barbata*, but with larger bracts, more open heads and a very different calyx The flower is reported (by a native collector, of the Chin Hill specimens) to be yellow

SUB-GENUS 2 MOORCROFTIA.

16 *b.* LETTSOMIA SCORTECHINII *Prain,* leaves petioled ovate-acute glabrous above, very sparsely hirsute with rusty hairs beneath, peduncles long, bracts deciduous, corymbs few-fld, sepals orbicular minutely adpressed grey-tomentose externally Argyreia Scortechinii *Prain Mss*

MALAY PENINSULA· Perak, *Scortechini !*

A strong climber, branches and peduncles rusty brown *Leaves* 2–3 in by 1–2 in, very thick, base rounded, petiole ⅛–⅜ in minutely rusty pubescent *Peduncles* 2–5 in, corymbs 3–5 fld, bracts caducous before the flowers expand *Sepals* ¼ in, in fruit ⅓ in, the inner pair larger than the three outer *Corolla* ⅝ in densely fulvous strigose outside *Fruit* sub spherical, ⅓ in diam, tip slightly umbonate, smooth, nearly dry, lower ¾ths closely embraced by the calyx

Closely related to *L rubicunda,* but with fewer-fld cymes, rather smaller corolla and fruit, somewhat different calyx, and very different leaves and tomentum

16 *c.* LETTSOMIA RIDLEYI *Prain,* leaves large elliptic acuminate quite glabrous above tomentose especially on the nerves beneath, peduncles usually short, cymes sub-capitate surrounded by large ovate acute foliaceous persistent bracts, sepals sub-equal ovate lanceolate ashy-pubescent externally Argyreia Ridleyi *Prain Mss*

VAR. typica, leaves rather larger, 5½ by 3½ in, outline regularly elliptic, sparsely hirsute except on the nerves beneath, as are the petioles, pedicels and bracts externally.

MALAY PENINSULA Johore, at Kota Tinggi, *Ridley*, n 4214! Chan Chin, *Lake & Kelsall* !

VAR velutina *Prain*, leaves somewhat smaller, 4 in by 2½ in, slightly narrowed from above the rounded base, densely hirsute especially on the nerves beneath, as are the petioles pedicels and bracts externally

MALAY PENINSULA Singapore, at Bukit Mandan, *Ridley*, n. 1635!

Scandent, branches sparsely ashy hirsute *Leaves* petioled, petioles 1–3 in *Peduncles* 2–6 in, heads 1½ in diam, 8-10-fld, bracts sessile, quite glabrous above *Sepals* ⅓ in corolla 1¼ in tubular funnel-shaped, hirsute externally *Berry* ½ in by ⅓ in, ovoid, two thirds embraced by calyx

Easily distinguished by its large bracts from all hitherto reported *Moorcroftias* except from *L Maingayi*, where however the heads are sessile, or nearly so, the flowers are larger, and the bract and sepals much larger, longer and more lanceolate A very distinct species

17 LETTSOMIA MAINGAYI *Clarke*, *Ridley*, *Trans Linn Soc* n s., iii 323

Add to description of *F B I* —

Bracts dark purple above, corolla 2¼ in long, tubular, slightly enlarging upwards, purple, the folds whitish, hairy outside glabrous within, filaments inserted near base of tube, glandular-hairy at the thickened base.

Add to localities of *F B I* —Perak, *Scortechini* ! Pahang, *Ridley*.

19 LETTSOMIA ADPRESSA "*Miq* "

Add to localities of *F. B I* —

PERAK Larut, etc, very common, *Scortechini* n 1280! *Kunstler* n. 2457! 5400! *Wray* n 1914! 3298! 3961!

Recent Penang gatherings are *Curtis* n 318! *Kunstler* n 1324! n 5271!

Corolla dull pale claret (*Wray*) or pale pink and white (*Kunstler*) or white with claret stripes (*Wray*) *Fruit* at first green with a reddish tint, becomes bright pink and at length red brown when ripe

20 LETTSOMIA PENANGIANA "*Miq*"

VAR typica, leaves thinly coriaceous, secondary nerves obscure.

Add to localities of *F B I* —

PERAK Larut, etc, very common, *Scortechini* n 1147! *Kunstler* n 2048! n 2574! n 5339! *Curtis* n 2034! *Wray* n 2095! 2334! 2601! 2733! (A recent Penang gathering is *Curtis* n 1586!)

The *corolla* is as figured by Choisy, as a rule the terminal flower of the cyme is distinctly larger than the others, in color bright claret (*Wray*) or purple (*Kunstler*), the fruit a beautiful rose pink (*Wray*) bluish red (*Kunstler*) or purplish (*Curtis*). The leaves beneath are very characteristically glandular-punctulate

VAR reticulata *Prain*, leaves thicker, secondary nerves beneath very distinct

PERAK Larut, *Kunstler* n 8544!

The peduncles and pedicels of this plant are rather shorter than in *L penangiana*. The sepals though as long are rather narrower, and the corolla—described by Kunstler as "waxy white, pale blue inside"—is but two-thirds the length and only half the width of that of *L penangiana* But the leaves have exactly the sparse adpressed tomentum of the type and have the same characteristic glandular punctulation, while the fruit—described by *Kunstler* as "rich pink"—is indistinguishable from that of *L penangiana*; so that this form, though very distinct, does not appear to deserve more than varietal rank

21 LETTSOMIA ? KURZII *Clarke*

This plant is shown by Kurz's specimens to be *Argyreia Hookeri* Clarke Mr Clarke had not an opportunity of examining the material from which Mr Kurz described his *Argyreia zeylanica* (*For Flor Brit Burma* ii, 215) That description is not very clear and the three varieties recognised by Mr Kurz refer, as the sheets named by him in the Calcutta Herbarium show, to as many very distinct species, VAR. *populifolia* is *Argyreia Hookeri* Clarke, and is not = *Argyreia populifolia* Gaertn, VAR *hirsuta* is *Argyreia venusta* Choisy, and is not = *A populifolia* VAR *hirsuta* Thwaites, VAR *pedunculаris* is *Convolvulus pedunculаris* Wall, which is the same thing as *Lettsomia sikkimensis* Clarke.

22 LETTSOMIA CURTISII *Prain*, leaves large elliptic shortly acuminate glabrous except for a few hairs on the midrib above, sparingly hispid beneath, peduncles long, cymes compound subumbellate, bracts deciduous, sepals coriaceous the three outer sparingly hirsute rounded, the two inner deeply emarginate glabrous Argyreia Curtisii *Prain Mss*

MALAY PENINSULA: Selangor at Kwala Lampar, *Curtis* n 2158!

Scandent, branches brown glabrous *Leaves* long petioled 4–5 in by 2½–3 in, petioles 2–3 in glabrous *Peduncles* 4–10 in brown glabrous, bracts deciduous, cymes rather open, 2½–3 in diam, 12–16-fld *Sepals* ¼ in *Berry* ovoid, fleshy, ¾ in by ½ in, the lower third only embraced by the calyx *Corolla* not seen

A very distinct species, easily recognisable by its emarginate inner sepals

23 LETTSOMIA KUNSTLERI *Prain*, leaves petioled large elliptic acuminate, quite glabrous above sparsely strigose-hirsute beneath, nerves more densely hirsute as are the petioles, peduncles and young branches: bracts small linear-lanceolate hirsute deciduous, peduncles long, cymes loose 12–20-fld, flowers small, sepals orbicular subequal, 3 outer pubescent the others glabrous externally Argyreia Kunstleri *Prain Mss*

MALAY PENINSULA: Perak, Goping, *Kunstler* n 732! Chanderiang, *Kunstler* n 5672! Kota, *Wray* n 2856! DISTRIB Sumatra

A slender climber "50–80 feet long" (*Kunstler*) *Leaves* 3½–4½ in by 2–2½ in, glossy above (*Kunstler*), petioles 1–1½ in *Peduncles* 5–8 in, pedicels ¼–⅓ in, cymes 2–3 in across, bracts ⅓ in, *sepals* ⅙ in the outer (originally hirsute) three ultimately glabrescent *Corolla* ½ in or less, white outside, bright pink or red within, externally hirsute *Berry* ½ in by ⅓ in, the lower fourth embraced by the calyx

A very distinct *Moorcroftia* perhaps nearest to *L rubicunda* but well distinguished by its small flowers from all the other species of the section With this the writer identifies *Forbes* n 2530, from Sumatra (in fruit only), which has, however, rather longer petioles and less sharply acuminate leaves than the Perak plant, while the midrib near the base of the leaf is sparsely hirsute above Perhaps Forbes's plant should be considered varietally distinct, it does not, however, appear to the writer to deserve specific rank

5 IPOMOEA Linn.

Sub-genus I Calonyction Key to the Indian Species

* Sepals lanceolate (glabrous), seeds glabrous, (leaves glabrous above and below, capsule ½ in diam) —
  § Corolla white, tube linear, glabrous within, *stamens exserted, sepals cuspidate* … *I bona-nox* var *grandiflora*
  §§ Corolla *purplish*, tube infundibuliform, hairy within, stamens included, *sepals lanceolate not cuspidate* … *I muricata*
** Sepals ovate, seeds hairy, (stamens included) —
  ¶ Sepals glabrous, leaves glabrous above and below, (hairs on seeds short, capsule 1 in diam) —
    § Corolla-tube linear .. *I glaberrima*
    §§ Corolla tube *wide infundibuliform* .. *I longiflora*
  ¶¶ Sepals hirsute, leaves beneath and petioles hirsute, corolla-tube linear —
    § *Branches pilose*, leaves deep-cordate Corolla long, hairs on seeds short, capsule ½ in diam .. *I yomæ*
    §§ Branches glabrous, leaves shallow cordate Corolla rather short, *hairs on seeds very long*, capsule 1 in diam … *I jucunda*

1. Ipomoea bona-nox Linn.—The Moon-flower

var *grandiflora* C B Clarke

Add to distribution of *F B I.* —

Australia Baron Von Mueller has sent (under the name *I longiflora*) to Herb Calcutta excellent specimens of *I bona-nox* with the cuspidate sepals and exserted stamens characteristic of the species

As in true *I bona-nox*, which hardly differs varietally from this, the stamens are always far exserted This is well shown in *Rheede*, *Hort Malabar*, xi, t 50 which therefore belongs here and not to the coast moon-flower, where the stamens do not reach beyond the junction of the mid and upper thirds of the tube Consequently *Ipomoea grandiflora* Lamk, which is based on Rheede's figure, also comes here as to the citation the diagnosis however applies to *I yomæ* alone of Indian *Calonyctia*

2. Ipomoea muricata *Jacq* —The Purplish Moon-flower

Add to localities of *F. B I* —

CENTRAL INDIA, near Goonah, *King* ! "Montes Silhet," (KHASIA or JAINTEA) *Wallich, mixed with* Convolvulus asper (*I yomae*) *under* Cat. n 1388 ! UPPER BURMA Shan Hills, *King's Collectors* !

Add to distribution of *F B I* —

Persia (*fide* Roxburgh), S. China

3 IPOMOEA GLABERRIMA *Boj* ex *Bouton* in *Hook. Journ Bot* i, 357 [1834], *Baker*, *Flor Maurit* 211. I grandiflora *C B Clarke* in *Flor Brit. Ind* iv., 198, *not of Lamk either as to description or as to synonyms cited, and excluding the synonyms* I longiflora, I macrantha, I tuba, Convolvulus tuba, Calonyction grandiflorum *and* C longiflorum, *which are all*=I. longiflora *R Br* (*I. trichosperma* Bl.) *also the synonym* I jucunda *which is a distinct species also the synonyms* Convolvulus grandiflorus *Linn. f*, C asper, Calonyction asperum, *which are*=I Yomæ *also the synonym* C pseudo-muricatum, *which is not, by its description, distinguishable from* I. muricata —The COAST MOON-FLOWER.

Substitute for localities of *F B. I* —

SEA-SHORES OF INDIA Travancore, at Quilon *Rottler* ! Laccadives, Betrapar *Hume* ! *Alcock* ! Ceylon, at Dichwale, close to the sea, *Thwaites C P* n. 3536 ! Coromandel coast, *Wight* ! Sunderbuns, *Kurz* ! *Heinig* ! Arracan coast, at Copal, *Kurz* ! in Diamond Island, *Prain* ! Andaman Group Great Coco, *Prain* ! Little Coco, *Prain* ! Narcondam, *Prain* ! South Andaman, at Perseverance Bay, *Kurz* ! Rungachang, *Prain* ! Navy Bay, Port Mouat, and many other points on the coast, *King's Collectors* ! Nicobars *E H Man* !

The plant common in the Deccan is *I longiflora*, that from Dolosbage district, Ceylon is *I jucunda*

This species is easily recognised by its close general resemblance to the true moon-flower, and as easily differentiated by its habitat, by its included stamens, by its blunt sepals, and by its hairy seeds From *I longiflora* (*I trichosperma*) it is as easily differentiated by its leaves never being lobed or hastate, though sometimes those of *I longiflora* are entire and therefore not distinguishable from those of *I glaberrima*, the corolla-tube of *I longiflora* is rather widely funnel shaped below the limb, while that of *I glaberrima* is straight as in the true moon flower Kurz (*For Flor Brit Burma* ii, 218) in his *Ipomoea campanulata*, which is mainly *Argyreia tiliaefolia*, has also included this plant

4 IPOMŒA LONGIFLORA *R. Br.*, *Prodr Flor. Nov Holl.* 484 [1810] (*not* I longiflora *Humb & Bonpl* ex. *Willd.* in *Enum Hort Berol*, i, 207 [1809] *which is* I bona-nox *Linn*), *Benth*, *Flor Austral* iv, 418 I latiflora *Roem & Schult*, *Syst* iv, 240 [1819] I. macrantha *Roem & Schult Syst* iv, 251 [1819] I tricosperma *Bl. Bijdr* 710 [1825], *C B Clarke* in *Flor. Brit Ind* iv, 198 (*excluding the synonym* I Yomae *which is a distinct species*). Convolvulus latiflorus *Desr* in *Lamk Encyc Meth.*

iii, 561 C grandiflorus *Jacq*, *Hort Vindol* iii. t 69 (*not of Linn. fil. even in part*) C longiflorus *Spreng.*, *Syst* i, 595 Calonyction speciosum *Choisy*, *Conv Or* 59 VAR α vulgare, *DC Prodr*. ix, 345 *in part, and* VAR δ laeve, *Prodr l c*, *altogether*, *Miq*, *Flor Ind. Bat* ii, 596 (*where the same confusion exists*) · C. trichospermum *Choisy*, *Conv Or* 60, and *DC. Prodr.* ix, 346, *Miq*, *Flor Ind Bat* ii, 598 C diversifolium *Hassk. Flora* (1842) *Beibl.* p 189, *Pl. Jav. Rar* 523—The WIDE-TUBED MOON-FLOWER.

Add to localities of *F B I* —

WESTERN INDIA Kanara, *Talbot* ! CHITTAGONG, Fenoa Hill, *King's Collectors* ! ANDAMANS Hills near Port-Mouat, *King's Collectors* ! Add to distribution —Australia, West Indies

The usually lobed leaves (they are not however always lobed in Old World specimens, and do not seem to be so in American ones) and the funnel shaped corolla-tube distinguish this species very well The reversal of the leaf character in this, as compared with *I bona nox*, is worth mentioning in that species it is in America that the leaves may be either lobed or entire, but are usually lobed, wild specimens of the Asiatic form of the "true Moon-flower" seem never to have lobed leaves

4 *b*. IPOMOEA YOMAE *Kurz*, *For Flor Brit Burma*, ii 218 [1877], leaves deep-cordate, sinus usually obtuse, long acuminate, membranous, generally glabrous except the nerves above, always sparsely or closely adpressed-pilose beneath as are the petioles and the younger branches, pedicels short axillary 1 (rarely 2 or 3)-fld, sepals ovate subacute subequal externally adpressed pilose, in fruit glabrescent, corolla hypocrateriform, tube long straight glabrous externally, stamens included, capsule ovoid, seeds dark brown velvety throughout with shaggy margins. I. trichosperma *C B Clarke in F B I*, iv., 198 *in part, not of Blume* Convolvulus grandiflorus *Linn f*, *Suppl* 136 *as to description, and excluding the syn Rheede. Hort Malab* t 50 C asper *Wall Cat.* n 1388 Calonyction speciosum *Choisy* VAR γ pubescens, *Choisy, DC Prodr* ix, 345 *as to the description* C asper *Choisy. DC Prodr* ix, 345, *in part* C mollissimum *Zoll*, *Syst Verzeichn* 131, *Miq*, *Flor Ind Bat* ii 597

SILHET *Wallich* ! PEGU Yomah, *Kurz* ! TENASSERIM Mawayda, *Gallatly* ! DISTRIB Java

A large climber, branchlets muricate, leaves 4–8 in by 3–7 in, petioles 1–3 in ; pedicels ½–1 in, thickened in fruit under the capsule, on axillary peduncles with pulvinar swellings on branch at their base, ¼–1 in long if 1-fld 1–2½ in long when 2 or 3-fld, sepals ½ in long somewhat enlarged in fruit, corolla white, tube 5–6 in long, capsule ovoid ¾ in long ½ in in diam

4 *c* IPOMOEA JUCUNDA *Thw*, *Enum.* 211 [1860], leaves rounded cordate, rather long acuminate entire glabrous above tomentose beneath

as are the petioles, pedicels axillary, 1–3-fld, puberulous as long as the petioles, sepals ovate-oblong mucronulate externally hirsute, corolla hypocrateriform, tube straight puberulous externally, stamens included, capsule large depressed-ovoid, seeds densely clothed throughout with very long greyish-brown silky hairs I longiflora *Benth.*, *Flor. Austr* iv, 419 *in note.* I grandiflora *C. B Clarke*, *Flor Brit Ind*, iv, 198 *in part, not of Lamk*

CEYLON Dolosbage district, rare, *Thwaites* n. 3448!

A large lofty night-flowering climber, leaves 3½ in by 3 in, petioles and pedicels 2 in, pedicels usually 1-fld, sepals 1 in long, sub-reflexed in fruit, corolla white, tube 2 in long, limb 4 in across, capsule ¾ in long about 1 in in diam

SUB-GENUS III PHARBITIS

8 *b* IPOMOEA CONGESTA *R Br*, *Prodr Fl Nov Holl* 485 [1810], leaves broadly or deeply cordate acute entire or slightly 3-lobed, softly sparingly hirsute above, more densely below, flowers large in congested cymes on long peduncles with sometimes a foliar bract close to the flowers, sepals long lanceolate acuminate, corolla suddenly campanulate from a short narrow cylindric base I congesta *Benth Fl Austral* iv, 417 Convolvulus congestus *Spreng Syst* i, 601 Pharbitis insularis *Choisy, Conv. Or* 57, *DC Prodr* ix, 341 Ipomœa insularis *Steud*

CHITTAGONG Kodala Hill, *King's Collector!* MALAY PENINSULA Singapur, *Hullett!* DISTRIB N Australia, Polynesia

A tall hirsute climber, leaves 3–6 in by 2–5 in, petioles 2–3 in, peduncles 3–7 in, softly hairy as are the petioles and stem, foliar bracts when present 1½ in by ⅓–½ in, with cuneate more rarely sub-cordate base, cymes 3–7 fld; sepals ¾ in long, corolla blue purple or mixed red and blue, nearly 3 in long

Mr Hullett has noted on his specimen (n 646) "Jany 1885 blue convolvulus, wild? Have never seen it in seed" Perhaps therefore it is only an escape It is not however at all frequent in cultivation in India and its occurrence in the Chittagong Hill Tracts in at least a thoroughly naturalised state leads the writer to provide a description

10. IPOMOEA DISSECTA *Willd*

Add to localities of *F B. I* —

UPPER BURMA Shan Hills, 4,000 ft., *Collett! King's Collectors!*

SUB-GENUS IV. ANISEIA.

13 IPOMŒA BARLERIOIDES *Benth*

Add to localities of *F B I* —

UPPER BURMA Shan Hills Meiktila, *Collett!* Koni, *Prazer!*

13 *b* IPOMŒA NANA *Coll & Hemsl.*, *Journ Linn Soc* xxviii., 97, leaves simple shortly petioled or sub sessile, thickly herbaceous, obovate-lanceolate or narrow-oblong obtuse or acute, base cuneate, margin

entire on both surfaces sparsely hirsute with long strigose hairs, flowers axillary solitary, peduncles short, sepals narrow lanceolate acuminate unequal externally pilose, corolla narrowly infundibuliform sparsely hairy externally, stamens included, filaments hirsute.

BURMA; Shan Hills, 4,000 ft., common, *Collett!*

An erect or ascending herb, 6–12 in. high, root fusiform, leaves 1½–2½ in. *Sepals* ½ in. long. *Corolla* 2½–3 in. long, 1¼ in. across mouth.

The sepals in fruit are reflexed, but the fruits themselves have fallen, and it is not known whether they have been capsules or berries. The flowers are very like those of *Ipomœa barlerioides*, but the plant has the facies of a *Lettsomia* rather than of an *Ipomœa*.

13 c. IPOMŒA POPAHENSIS *Coll. & Hemsl.*, *Journ. Linn. Soc.* xxviii, 97; leaves simple shortly petioled narrowly oblong lanceolate or sometimes linear apiculate, entire, on both surfaces sparsely hirsute with short strigose hairs, flowers axillary on short peduncles with usually 1, rarely 2–3 flowers, sepals ovate-lanceolate acuminate or linear lanceolate, pilose externally as are the lanceolate bracts at the base of the very short pedicels, corolla narrowly infundibuliform sparsely hairy externally, stamens included, filaments papillose.

UPPER BURMA: on Popah Daoung, *Collett!* Shan Hills, near Boi Tat, 3,000 ft., and at Meiktila, *Collett!*

A very slender twiner, leaves 1½–4 in. long, sepals ⅓–¾ in. long, ⅛–¼ in. wide, purplish, corolla purple 2 in. long, 1 in. wide at mouth.

This species also has flowers very like those of *Ipomœa barlerioides*. None of the specimens have ripe fruits, the largest unripe ones present are ¼ in. in diameter sub-globose smooth with a thin pericarp, which however shows no trace of ultimate dehiscence. The plant suggests by its general facies that it may be a *Lettsomia*, in which case it would come nearest *L. barbata* Clarke and *L. Mastersii* Prain.

SUB-GENUS VI. EUIPOMOEA.

20. IPOMOEA PES-TIGRIDIS *Linn.*

Add to localities of *F. B. I.*:—

UPPER BURMA: Sagaing, Pyinmana, Fort Stedman, *King's Collectors!*

21. IPOMOEA ERIOCARPA *Br.*

Add to localities of *F. B. I.*:—

TENASSERIM: Moulmein, *Falconer!* BURMA: Rangoon, *Cleghorn!* Shan Hills, 3,000 ft. *Collett!*

22. IPOMOEA STOCKSII *Clarke.*

Add to localities of *F. B. I.*

CENTL. INDIA: Goonah, *King!*

27. IPOMOEA POLYANTHA *Miq.*

The synonym *Convolvulus polyanthus* Wall. Cat. n. 1378 should be omitted Wall Cat n 1378 is *Ipomoea staphylina* Roem & Schult VAR *malayana* Prain (Lettsomia sumatrana *Miq*).

VAR. *affinis* is now reported from Chittagong, Khasia Hills, Shan Hills, and Tenasserium in addition to the localities mentioned in *F. B I*, it is further distributed to Yunnan.

28. IPOMOEA RENIFORMIS, *Choisy*

Add to localities of *F B I.* —

UPPER BURMA 'near Amerapoora in fields', *Wallich* !

30 IPOMOEA OBSCURA, *Ker*

VAR *typica*, add to localities of *F B I* —

Throughout Tenasserim; in Burma from Rangoon to Bhamo and the Shan states Andamans, frequent

VAR *gemella*, add to localities —

CENTL INDIA Goonah, *King* ! S. INDIA Dindygul, *King* !

This form hardly deserves varietal rank

33 IPOMOEA PORANOIDES *Clarke.*

Add to localities of *F B I* —

N.-W HIMALAYA Garhwal Babur, *King* ! NAGA HILLS: Kohima, *C B. Clarke*, *Prain* !

34 IPOMOEA CYNANCHIFOLIA *Clarke.*

Add to distribution of *F B. I* —South-West China

Dr J Anderson collected this species at Poneshee in Yunnan

36 IPOMOEA DENTICULATA *Choisy.*

Substitute for localities of *F B I* —

SEA-SHORES OF INDIA, INDO-CHINA AND MALAYA: Westn India, Kanara, *Talbot* ! Laccadives, Minikoi, *Alcock* ! Ceylon, at Galle, *Thwaites* ! Arracan, at Akyab, frequent along the sea-shore, *Kurz* ! Kobah, *Kurz* ! Diamond Island, *Prain* ! Andaman Group Narcondam, Great Coco, Little Coco, *Prain* ! S. Andaman, *King's Collectors* ! Rutland Island, Little Andaman, *Prain* ! Nicobars, Kamorta, *Kurz* ! Great Nicobar, *Kurz* ! Malay Peninsula, Perak, *Scortechini* ! Penang, *Curtis* ! Pahang, *Ridley* !

42 IPOMOEA STAPHYLINA *Roem* & *Schult*

VAR typica corolla wide-campanulate from a very short narrow cylindric base, usually $\frac{1}{2}$–$\frac{3}{4}$, very rarely 1 in. long. and $\frac{1}{2}$–$\frac{3}{4}$, sometimes 1 in diam at limb.

To this belong all the synonyms of *F B I*, except *Convolvulus polyanthus* Wall, and all the localities except the Penang one

VAR malayana *Prain*, corolla uniformly narrowly infundibuliform from base to limb, 1 to $1\frac{1}{4}$ in long and hardly $\frac{1}{8}$ in diam at mouth. Convolvulus polyanthus *Wall Cat.* n 1378 (*not* Ipomoea polyantha *Miq*) Lettsomia sumatrana *Miq*, *Flor. Ind. Bat*, *Suppl* 560 (1860)

MALAY PENINSULA; Perak; *Kunstler* ! Penang, *Wallich* ! DISTRIB. Sumatra

Wall Cat n 1378 is exactly the same as authentic specimens of *Lettsomia sumatrana* collected by Teysmann in Sumatra Though the two varieties differ so markedly in the shape of the corolla, the leaves, calyces, ovaries and capsules are identical The corolla in the Malay variety is much as in the Indian, red purple at the base, white streaked with pink near the mouth

42 *b.* IPOMOEA NYMPHAEFOLIA *Bl*, *Bijdr* 719 [1825] not of *Grisebach* [1866], leaves orbicular-ovate, shortly acuminate entire glabrous on both surfaces or sparingly hairy on the nerves beneath, peltate with a rounded or slightly retuse base, the floral leaves more deeply cut and at times cordate with a narrow sinus, flowers large in loose cymes on a common peduncle sometimes shorter than the petioles sometimes longer than the leaves, sepals broad obtuse coriaceous nearly equal, corolla wide campanulate glabrous externally, capsule large Ipomœa peltata *Choisy*, *Conv Or* 70 (1833), *DC Prodr* ix, 359, *Miq Flor Ind Bat* ii, 605, *Benth*, *Flor Austral* iv, 418, *Baker*, *Flor Maurit* 208 I Rumphii *Miq*, *Flor Ind Bat* ii, 605 Convolvulus peltatus *Linn*, *Sp Pl* 1194 Spiranthera peltata *Boj*, *Hort Maurit* 226 —*Rheede Herb Amboin* v, 428, t 157 (both figures)

PERAK Pangkor, *Scortechini* n 1074 ! DISTRIB Mascarene Islands to Malaya, N Australia and Polynesia

A tall woody climber, leaves 6–10 in by 5–8 in, Cymes 4–15 fld, sepals glabrous ¾ in in flower, nearly 1 in in fruit, corolla 2–2½ in, yellowish white with red spots in the Mascarene Islands, yellow or white or purplish in Malaya, white in N Australia and Polynesia anthers hirsute, capsule 1 in in diam, seeds pilose *Ipomoea Grisebachii* (I nymphæfolia *Griseb*, *Cat Pl Cub.* [1866], is not this plant The flowers in Rumphius' figures are much too small, otherwise the description and figures leave no doubt as to this being the plant intended

43. IPOMOEA CAMPANULATA *Linn*

VAR typica Add to synonyms of *F B I* —Argyreia tiliaefolia *Kurz*, *For Flor Brit Burma* ii, 215, *not of Wight* and delete syn I campanulata *Kurz*, l c 218

Kurz's *Argyreia tiliaefolia*, as his elaborate description and *all* his specimens in Herb Calcutta show, is *Ipomœa campanulata* Linn which extends from South-West Yunnan (*Anderson* !) and the Shan States (*Manders* ! *King's Collectors* !) to Tenasserim *Argyreia tiliaefolia*, a purely sea-shore species, is on the other hand the plant described by Kurz, *l c*, and named by him in Herb Calcutta, *Ipomoea campanulata*, though he has included in this species his specimens of *Ipomoea* (Calonyction) *glaberrima* as well

VAR illustris Add to localities of *F B I.* —

CEYLON *Thwaites* ! SUNDERBUNS *Heinig* ! ARRACAN mouth of Kolodyne river, *Kurz* ! Coco group, *Prain* ! South Andaman, *King* ! *Prain* ! *King's Collectors* ! NICOBARS *King's Collectors* ! MALAY PENINSULA Penang *Curtis* !

This very distinct sea shore form seems, as Mr Clarke suggests, to deserve specific rank Though collected by Kurz, it is not included by him either in his *Ipomoea campanulata* or his *Argyreia tiliaefolia*, a note in Herb Calcutta shows that he shared Mr Clarke's opinion that it is perhaps deserving of specific rank

44. IPOMOEA LACTEA *Wall.* ex *Voigt* in *Hort Suburb Calcutta* 361 [1845] Convolvulus lacteus *Wall* ex *Grah. Cat Bomb Pl* 133. Ipomoea Gomezii *C B Clarke* in *Flor Brit Ind.* iv, 211 [1883] in part, and as to the Tavoy plant only

ASSAM foot of Naga Hills, *Masters* ! TENASSERIM Tavoy, *Gomez.*

There is not now at Calcutta a specimen collected by Gomez in Tavoy, but there is a specimen collected in the Calcutta Garden, noted as being raised from seed received from Burma from Gomez, and named in Dr Wallich's own handwriting *Convolvulus lacteus*

The calyx and corolla in this species closely resemble those of *Ipomoea nymphaefolia* but are twice as large, in fruit the calyx and capsule are nearly thrice as large As in *I nymphaefolia* the seeds are hairy, the corolla externally is glabrous *I lactea* in fruit still more closely resembles a macrocarpous form of *I petaloidea* from the Andamans and the Malayan Archipelago This plant, which the writer had supposed to be the Andaman one included by Mr Clarke under *Ipomoea Gomezii* has a corolla smaller than that of *I lactea*, and is shaggy externally even when full grown, whereas the corolla of *I lactea* is glabrous externally even in bud Dr Stapf, however, informs the writer that while the Andaman plant referred to is certainly not *I lactea* it does not appear to be *I petaloidea* either "It is, however," Dr Stapf says, "a *very* poor one There is one flower mounted with it, though not exactly attached," he also says that, though the calyx agrees with that of the variety of *I petaloidea* referred to, 'the shrivelled corolla seems to have had a narrow tube about two inches long and is glabrous outside' This description would suit a badly prepared specimen of *Ipomœa glaberrima*, and it is not impossible that, so far at least as the flower is concerned, the Andamans *I Gomezii* will have to be referred to that species.

45 IPOMOEA CYMOSA *Roem & Schult*

VAR typica Add to localities of *F B I* —Equally abundant in Indo-China from Upper Assam and Bhamo to the Andamans and Nicobars, and the Malay Peninsula.

To this belong all the synonyms of the *F B I* except *Convolvulus umbellatus* Wall (*Cat* n 2329), which is from a plant grown in the Calcutta Botanic Garden. It forms the type of Choisy's *Ipomœa cymosa* VAR *culta*, and is perhaps a synonym of *Ipomœa umbellata* Meyer

VAR culta, *Choisy, DC Prodr* ix, 371; leaves cordate with an obtuse sinus and rounded auricles, softly velvety tomentose on both surfaces, flowers large uniformly dark-yellow Convolvulus umbellatus *Wall Cat* n 2239.

LOWER BENGAL naturalised in various places near the Royal Botanic Garden, *Kurz* ! MALAY PENINSULA Perak, at Sungah Ryah, *Kunstler* !

The cymes in this plant are almost umbellate and the leaves, which are 4 by 3½ in , are much wider than in VAR. *typica,* where also the corolla is pure white or white tinged with yellow The calyx and seeds are exactly as in *I cymosa,* but the corolla is considerably larger, and in size and colour agrees with that of *Ipomoea umbellata* Mey (*Prim Flor Esseq* 99), an American plant with very similar leaves equally deeply cordate, but with an acute sinus and glabrous above very sparingly hirsute below This latter difference is no greater than exists between different forms of *I cymosa* proper, and it is probable that *I cymosa,* VAR *culta,* and *I umbellata* are but forms of one plant which is only a variety, as Bentham (*Flor Austral* iv , 423) suggests, of *I cymosa*

It has always been supposed that Wallich's *Convolvulus umbellatus,* cult in Hort Calcutta, was derived from American seed , it now seems as probable that Wallich's plant was of Malayan origin

Dr Stapf who has kindly examined this plant, doubts very much that it is entitled to varietal rank He also adds "it is extremely like *I umbellata* Meyer, from America, and I cannot find characters to separate them "

45 *b.* IPOMOEA RUBENS *Choisy, Convolv Or* 81 and *DC Prodr* ix, 371. Convolvulus rubens *Wall Cat* 1421. C. glandulosus *Ham in Wall. Cat* 2252 Lettsomia rubens *Clarke, Flor Brit Ind* iv , 195

NORTH BENGAL Rangpur, at Pirganj, *Hamilton* , Purnea, near Caragola, *Kurz* ! ASSAM . *Jenkins* ! *Gibson* ! Goalpara, *Hamilton* ! *Simons* ! Gauhati, *Jenkins* ! Silhet, *DeSilva* ! Cachar, *Keenan*

This is, as Choisy says, an *Ipomoea* not a *Lettsomia* M Choisy does not appear to have seen fruit , Mr Clarke says, *loc cit* , that he had not seen any The plant, Mr Clarke adds, has been supposed a *Rivea* , its facies suggests an *Ipomoea* in the vicinity of *I cymosa* VAR *culta,* from which however, it differs in having fewer flowers in the umbelliform cymes, a tomentose calyx, a corolla which is whitish-purple instead of dark yellow, and strigose on the plaits externally instead of quite glabrous, as well as in having glabrous in place of hirsute seeds

There is no example of Hamilton's *Convolvulus glandulosus* at Calcutta, at Kew, or in the type set of Wallich's Herbarium at the Linnean Society , what however is evidently, from Choisy's description, the same thing, is represented at Calcutta by specimens collected in Assam (exact locality not stated) by Gibson, and at Gauhati by Jenkins These specimens have rather larger leaves than any of the others densely velvety tomentose on both surfaces, and closely resembling those of *Argyreia Roxburghii* There is however not the slightest difference as to calyx or corolla between these specimens and those which form the type of *Ipomœa rubens,* so that the separation of a variety *lanata,* proposed by M Choisy, appears to be hardly necessary The Goalpara specimens in Wallich's Herbarium (*Convolvulus bifidus,* Ham Wall Cat n 1421/B and n 1421/C) are identical with those of DeSilva from Silhet (Wall Cat n 1421/1) on which the species was founded Kurz's Purnea specimens have leaves less densely hirsute above.

The species is evidently very closely related to the next one of which there is not a specimen at Calcutta Being unable to separate it by Mr Clarke's description and figure, the writer asked that the two might be compared at Kew where the type of *Ipomœa Wattii* is preserved Dr Stapf, who has kindly made the comparison at Kew writes —"*Lettsomia rubens* Clarke, and *Ipomœa Wattii* are very like , but note the sepals, which are narrower and acute in the latter" This appears to be the only tangible distinction, and is perhaps hardly sufficient to separate the two plants, till however, full material of *Ipomœa Wattii* is available it would be improper to propose the formal reduction of Mr Clarke's species, a description of which, taken from the author's original diagnosis and figure, is given here

45 *c.* IPOMOEA WATTII *Clarke, Journ. Linn. Soc* xxv, 49, t. 22; leaves ovate-cordate acute, sparingly hairy above and on the nerves beneath, peduncles long, 3–5-fld., sepals widely oblong acute, hairy

NAGA HILLS Kohima, alt 5,000 feet, *Clarke*

Scandent *Leaves* 3½–2½ in, somewhat deeply cordate, petiole 2–3 in *Peduncles* 3–5 in, pedicels 1 in *Sepals* ⅛–½ in *Corolla* 1¼ in long, and as much across, white with a purple tinge *Capsule* glabrous ¼–⅓ in diam, seeds glabrous

The chief difference, apparently the only one, between this and *Ipomœa rubens* lies, as already said, in the sepals, which are here widely oblong acute, while in *I rubens* they are widely oblong obtuse and rather shorter

From the figure quoted, the artist has altogether omitted the tomentum of leaves and calyx, while the sepals are shown as lanceolate instead of widely oblong.

46 IPOMOEA PETALOIDEA *Choisy*

VAR typica, add to localities of *F B I* —

BEHAR *Kurz! Wood! Revd Campbell!* CENTL INDIA Godaveri district, *Beddome! Gamble!* Sagor, *Vicary!*

VAR pauciflora *Clarke, Flor Brit Ind* iv, 212 I petaloidea, VAR ? foliis fere linearibus *Coll & Hemsl, Journ. Linn Soc*, xxviii, 97 I. petaloidea VAR linearifolia *Kurz Mss in Herb Calc* Add to localities —

BURMA Pegu, at Palawa Zeik, Tonkyeghat, *Kurz!* Shan Hills, at Pwehla, 4000 feet, *Collett!* Southern Shan States, *Manders!*

This very distinct-looking variety has also been collected by Dr King near Mussorie, in the district where it was first obtained by Dr Thomson

VAR andamanica *Prain*, sepals larger, enlarging in fruit, capsule much larger Convolvulus platypeltis *Span Linnea* xv., 338.

ANDAMANS *Kurz! King's Collectors!* Common. DISTRIB Timor

The fruit of this closely resembles *Ipomœa lactea* Wall, but the corolla is much smaller and is shaggy externally Spanoghe's Timor plant, referred by Miquel to *I petaloidea*, is evidently this form

46 *b.* IPOMOEA KINGII *Prain* leaves narrow ovate cordate acute with shallow or deep rounded sinus and rounded auricles, glabrous above or with the midrib sometimes puberulous, sparingly hirsute on the nerves beneath, petioles long puberulous; peduncles glabrous longer than the petioles, bearing sometimes 1–3, more often a lax branching cyme of 5–12 flowers, with long smooth pedicels thickened, even in flower, under the calyx, flowers large, sepals broad ovate obtuse glabrous coriaceous, with membranous margins nearly equal, corolla wide campanulate glabrous externally, capsule large, seeds uniformly covered

with long brownish-grey hairs. Ipomoea cymosa VAR. macra *C. B. Clarke, Flor. Brit. Ind.* iv, 212; *Journ. Linn. Soc.*, xxv., 49.

SIKKIM: Rishap, etc., 2500–5000 feet, very common, *King!* *Gammie!* *Clarke!* *Gamble!* BOOTAN: *Parkes!* *Cummins!* ASSAM: Khasia Hills, *Griffith, Hooker!* Gauhati, *Simons!* Dibrugur, *Masters!* Naga Hills, *Clarke, Prain!* BURMA: Karen Hills, 3000 ft., *Kurz!* Shan Hills, 3000 ft., *Collett!*

A large climber; leaves 3½–6 in. by 2–4 in., petioles 1–3 in.; peduncles 2–6 in. with small deciduous linear bracts at origin of pedicels, which are from 1–2 in. long. *Sepals* ¼ in., reflexed but not enlarging in fruit. *Corolla* white, 2½ in. long, mouth 2 in. across. *Capsule* ¾ in. diam.

This is a very distinct species, much nearer to *I. petaloidea* (with which it agrees in having thickened pedicels and of which it has exactly the calyx) than to *I. cymosa*. It is however easily distinguished from *I. petaloidea* by its leaves, which are quite like those of *I. cymosa*, and by its glabrous corolla.

49. IPOMOEA CARNOSA *Br.*

Add to localities of *F. B. I.*:—

PAHANG: *Ridley!*

56 *b*. IPOMOEA GRACILLIMA *Prain*; glabrous, leaves pedately lobed, lobes narrow, spathulate sub-sinuate, peduncles 1–7 fld., filiform elongated, sepals ovate obtuse, corolla small purple, seeds velvety with a few long hairs at tip. I. palmata VAR.? gracillima, *Coll. & Hemsl.*, *Journ. Linn. Soc.*, xxviii., 97.

UPPER BURMA: Meiktila, *Collett!*

A slender climber; leaves 1–2 in. diam., petioles 1 in.; peduncles much larger than leaves (2–4 in.); sepals ⅙ in.; corolla ½–¾ in.; capsule ⅓ in.

Very closely resembles *I. palmata* in appearance but is easily distinguished by its much longer peduncles, its flowers less than half the size, and its very different seeds.

6. LEPISTEMON BL.

1. LEPISTEMON FLAVESCENS *Bl. Bijdr.* 722. Lepistemon Wallichii *Choisy Convolv. Or.* 61; *Flor. Brit. Ind.* iv. 216.

Add to localities of *F. B. I.*:—

MALAY PENINSULA: Perak, at Larut, *Scortechini* n. 1544! DISTRIB. Java, Borneo, Philippines.

Lepistemon Wallichii (Convolvulus cephalanthus *Wall. Cat.* n. 1402; Ipomoea Wallichii *Steud.*) scarcely differs from *Lepistemon flavescens* (Ipomoea flavescens *Steud.*) as has been already pointed out by Choisy (*DC. Prodr.* ix, 348.) Choisy, however, has not seen his way to formally uniting the two plants even when monographing the natural order; on this account, and also because the geographical areas of the two forms did not then seem to overlap, Mr. Clarke has kept up the distinctive name and position of the Indian one; he has however, pointed out how closely they are related, and how nearly both are allied to still another form from

Borneo and the Philippines The form collected by Father Scortechini in Larut differs somewhat from both the Indian and the Java plant, it has the widely urceolate corolla of *L flavescens*, and therefore is not true *L Wallichii*; at the same time it has sepals that are longer and more lanceolate than even in *L Wallichii*, and therefore is not true *L flavescens*

Dr Stapf writes — " I do not think that *L flavescens*, *L Wallichii*, and the Borneo-Philippine plant are specifically distinct They seem to be *very slight* variations of *one* species " This opinion, coupled with the communication from an intermediate locality of a form that combines the characters of Steudel's two " species," leads the writer to propose the identification of the Indian plant with that distributed throughout the Malayan region

9 CONVOLVULUS Linn.

* *Erect or diffuse, not twining (except sometimes* C glomeratus), *stigmas filiform, nearly as long as, or longer than the style*

† *Spiny or spinescent shrubs or under-shrubs.*

1 * Convolvulus leiocalycinus *Boiss Flor. Orient.* iv, 86, a rigid shrub with elongated again dividing branches, young parts adpressed-silky, elsewhere glabrous, the ends of branches and peduncles developing into short sharp spines, leaves small shortly petioled, shortly silky hairy, spathulate oblong subacute with rounded or sub-hastate bases, flowers solitary axillary, pedicels shorter than the leaves, sepals glabrous coriaceous ovate-obtuse mucronulate, corolla white glabrous 5–6 times longer than the calyx, ovary hirsute, stigmas filiform, as long as the style C lasiophlaeus *Jaub & Spach, Ill*, t 368 C lycioides *Boiss. Diagn*, Ser. 1, 7, p 29

Panjab Frontier *Duke* ! British Beluchistan *Lace* ! Distrib. Afghanistan (*Bellew*), Beluchistan, Persia

Height 3-4 feet, leaves ½ in or less, calyx ⅕ in, corolla 1-1¼ in. long, capsule ovoid

The occurrence of this species just within the British Indian frontier renders it necessary to supply a description of the plant It is readily distinguished from the next species by its hastate or cordate-based leaves

1. * * Convolvulus spinosus *Burm Flor. Ind.* 47, t 19, f 4, a low much-branched shrub with elongated again much divided branches, all parts covered with a short adpressed ash-grey silky pubescence, the ends of branches developing into sharp slender spines, leaves small elliptic subacute, bases narrowed, the uppermost linear and scale-like, flowers on axillary, 1–3-fld pedicels as long as the leaves, sepals hirsute coriaceous ovate-obtuse, corolla hirsute 3–4 times longer than the calyx, ovary hirsute, stigmas filiform as long as the style. C spinosus *Boiss., Flor Or* iv., 87, *not of Desr. nor of Eichwald* C. genistoides *Jaub & Spach. Ill* t 370.

NORTH-WEST FRONTIER: Nal, *Duke*. DISTRIB. Afghanistan (*Griffith*) Beluchistan (*Stocks*), Persia.

Height 1–3 ft.; leaves ¼–½ in.; calyx ⅛ in.; corolla ¾–1 in.

A description of this species is necessary for the same reason that calls for one of *C. leiocalycinus*. From that species the longer pedicels, the hirsute calyx and corolla, and the different leaves, easily distinguish it.

1 CONVOLVULUS SCINDICUS *Stocks*

† † *Herbaceous not spinescent.*

4 *b*. CONVOLVULUS LINEATUS *Linn*: *Boiss. Flor. Or.* iv., 97; adpressed sericeous, leaves oblong, the lower narrowed into a long petiole, the upper most often narrowly linear, cymes few-fld at the ends of the branches; flowers solitary shortly pedicelled, sepals oblong lanceolate membranous at the base, tips herbaceous spreading, corolla 3 times as long as the calyx, ovary hirsute. Convolvulus spicæfolius *Desr in Lamk. Encycl. Meth.* iii., 549 C. Besseri *Spreng Syst* i, 610.

BRITISH BELUCHISTAN. Quetta, *Stocks!* PUNJAB FRONTIER: frequent, *Sanders! Duke! etc.* DISTRIB: Europe, N Africa, Western Asia, Siberia.

Root-stock woody, stems 4–8 in., herbaceous numerous, ascending or procumbent, lower leaves 2–3 in. by ¼–½ in., petioles 1 in. or longer, stem leaves ¾–1 in.; sepals ⅜ in., adpressed sericeous; corolla rose, 1 in., externally adpressed, sericeous on the plaits.

Described for the reasons given under *C leiocalycinus* and *C. spinosus*.

6. CONVOLVULUS GLOMERATUS *Choisy*.

Add to localities of *F B. I.*.—

RAJPUTANA: Jodhpur, *King!*

7 *b*. CONVOLVULUS TENELLUS *Stocks*, *Hook Kew Journ.* iv., 172; pale-green, sparingly adpressed hirsute, leaves sessile linear, peduncles 1–3-fld, sepals ovate mucronulate or suddenly acuminate, quite glabrous, corolla ¾ in. wide, campanulate, ovary glabrous style very long. Convolvulus Stocksii *Boiss Flor Or.* iv, 110 [1879]. C Rottlerianus VAR. tenella *Clarke*, *Flor Brit Ind* iv, 219

SCINDE: Cutch, *Stoliczka!* DISTRIB. Beluchistan (*Stocks! Ball!*)

Erect strictly branched, stems and branches wiry, leaves ¾ in. very narrowly linear, peduncles long, 2–2½ in, sepals ⅛ in, corolla rose, ¾ in at mouth, very sparingly hispid along the angles.

This is extremely distinct from *C. Rottlerianus*, and may be at once recognised by its glabrous calyx and its much longer scarcely hirsute corolla.

Boissier's name, *C. Stocksii*, is given because there is a prior name *C tenellus* (*Desr.* in *Lamk. Encycl*) As the "C. tenellus" of Desrousses is a *Breweria* and not a *Convolvulus*, there is no reason why Stock's name should not be used.

7 *c*. CONVOLVULUS SINUATO-DENTATUS, *Coll. & Hemsl.*, *Journ. Linn. Soc.*, xxviii., 98, pubescent, leaves petioled thick cordate-

oblong sub-obtuse sinuate-toothed; flowers axillary solitary or pubescent; pedicels as long as the leaves bracteolate near the middle; sepals coriaceous ovate-obtuse pubescent externally; corolla twice as long as the calyx, externally hirsute, ovary glabrous.

UPPER BURMA: Shan Hills, at Pwehla, *Collett!* at Koni, *Prazer!*

Root-stock thick woody; stems slender prostrate internodes short; leaves ½–1 in. long, ¼–½ in. across, petioles ¼ in. or less; pedicels sometimes 1½ in. long, bracteoles 2 or 1, sepals ¼ in., corolla white, ½ in.

* * *Stems twining, stigmas narrowly oblong or linear, shorter than the style.*

9. CONVOLVULUS FLAVUS *Willd.*

Add to localities of *F. B. I.* —

RAJPUTANA: Mt. Aboo, *King!*

11. CONVOLVULUS MICROCALYX *Clarke.*

Substitute for localities of *F. B. I.* —

MISHMI: *Griffith* (mixed with *Porana paniculata*)! ASSAM: *Jenkins!*

11. *PORANA BURM.

3. PORANA SPECTABILIS *Kurz.*

Add to localities of *F. B. I.* —

ASSAM: Naga Hills, at Nichuguard, *Clarke;* Lushai Hills at Changsil, *Prazer!* BURMAH: Shan Hills, *Collett!* ANDAMANS: Coco Islands, *Prain!* S. Andaman, *Prain!* *King's collectors!*

13 *b*. DICHONDRA FORST.

Prostrate creeping small herbs; leaves entire, flowers small axillary, corolla campanulate deeply 5-lobed; ovary of 2 distinct carpels, each with an almost basal style, and 1 or 2 ovules, stigmas capitate. Fruit of 1 or 2 membraneous capsules, each with 1 or rarely 2 seeds.—Species 2, one tropical American, the other cosmopolitan in the tropics.

1. DICHONDRA REPENS *Forst.; Choisy, DC. Prodr.*, ix, 451; a slender creeping perennial, rooting at the nodes, hoary with minute pubescence, or silky; leaves long-petioled, orbicular or reniform; flowers solitary on peduncles shorter than the petioles, sepals obovate, very short; corolla yellow rather shorter than the calyx, carpels about as long as the calyx, nearly globular. *R. Br., Prodr.*, 491; *Wall. Cat.* 1339; *Benth. Flor. Austral.* iv, 438; *Coll. & Hemsl.*, *Journ. Linn. Soc.* xxvii, 99.

UPPER BURMA: Taong-Doung Mts., *Wallich!* Shan Hills, *Collett!*

King's Collectors! DISTRIB. Tropical and sub-tropical regions of both hemispheres.

Leaves ½–1 in diam ; petioles sometimes 2 in. (in Wallich's specimens as much as 4 in) long, sepals about 1 line long

15. CUSCUTA LINN.

1. CUSCUTA REFLEXA *Roxb.*

Add to localities of F. B. I. —

UPPER BURMAH · Karen Hills, *Mason!* Shan Hills, *Collett! King's Collectors!* Hotha, *J. Anderson!*

Add to distribution .—China

4 CUSCUTA CHINENSIS *Lamk.*

Add to localities of F B I. —

UPPER BURMHA Shan Hills, *King's Collectors!*

Natural History Notes from H M Indian Marine Survey Steamer 'Investigator,' Commander C F Oldham, R N, Commanding. Series II, No 11 *An Account of a Recent Collection of Bathybial Fishes from the Bay of Bengal and from the Laccadive Sea.—By* A. ALCOCK, M. B, C M Z S., *Superintendent of the Indian Museum*

Plates VI & VII.

[Received 31st May —Read 6th June]

INTRODUCTION.

The collection of deep-sea fishes recently added to the Indian Museum through the exertions of the Marine Zoological Survey is a large one and numbers many species, of which only those that appear to be either hitherto unknown or new to the Indian record are here noticed.

In the list of these new forms it is interesting to find *Hoplostethus*, *Thyrsites*, *Bembrops*, *Pœcilopsetta*, *Chlorophthalmus*, *Xenomystax*, (a remarkable deep-sea Eel of the Sauromurænesocine alliance, lately discovered by the U S. Steamer '*Albatross*' off the coast of Ecuador, and now appearing in the Laccadive Sea), *Nemichthys*, and *Triacanthodes*.

The discovery in these waters of representatives of these genera shows that the exploration of the Indian Seas is still far from complete, and leads us to hope that other unaccountable gaps in our knowledge of the geographical relations of the fish fauna of India may yet be filled up.

From recent experience, as from experience gathered in the past, it appears that the most promising ground for exploration, in these Seas, is that which lies between 150 and 250 fathoms.

I may state, in conclusion, that the species here described, but not figured, will in all probability be figured in next year's issue (Part III) of *Illustrations of the Royal Indian Marine Steamer 'Investigator.'*

ACANTHOPTERYGII.

Family **Percidæ**.

ACROPOMA, Schleg.

Parascombrops, Alcock, J. A. S. B., Vol. LVIII, pt ii, p. 296 ?*Melanostoma*, Dod., Denk, Ak. Wien, XLVIII., p. 5.

1. *Acropoma philippinense*, Gthr.

Acropoma philippinense, Gthr. Zool. Chall. Exp. Vol. I, pt vi., p. 51.

Parascombrops pellucidus, Alcock, J. A. S. B., 1889, Vol. LVIII, part ii, p. 296, Pl. XXII, fig. 1.

This species is characteristic of the Bay of Bengal in water between 75 and 150 fathoms deep.

I take this opportunity of stating that the generic name *Parascombrops* proposed by me in 1889 for this species is only a synonym of *Acropoma*, and must therefore be withdrawn.

Family **Scorpænidæ**.

MINOUS, C. V.

2. *Minous inermis*, Alcock

Minous inermis, Alcock, J. A. S. B., 1889, Vol. LVIII, pt ii, p. 299, Pl. XXII, fig. 4; and Annals and Magazine of Natural History, Sept. 1892, p. 207.

Specimens of this species dredged this year in the Bay of Bengal off Madras, at 133 fms., are encrusted with the same commensal Hydroid (*Stylactis minoi*) as the specimens dredged off the Máhánaddi, off the Godávari, and off the Malabar Coast in previous years. This confirms the already fairly well established opinion that the relation between the Hydroid and the Fish is a fixed and definite one.

Family **Berycidæ.**

HOPLOSTETHUS, C. V.

3. *Hoplostethus mediterraneum*, C. V.

For Synonomy, *vide* Gunther, 'Challenger' Deep-sea Fishes, p. 21.

A fine specimen dredged in the Bay of Bengal at Station 162, 145–250 fms., is a new addition to the record of the Indian Fauna.

Family Trichiuridæ.

THYRSITES, C. and V.

4 *Thyrsites bengalensis*, n sp., Pl. VI., fig. 1.

Closely related to *Thyrsites prometheoides*, Blkr.

$$\text{B. }7.\quad \text{D. }18\left|\frac{2}{13\text{-}14}\right|\text{ii.}\quad \text{A. }\frac{2}{11\text{-}12}\Big|\text{ii.}\quad \text{P. }14.\quad \text{V. }1.$$

Length of head two-sevenths of the total (caudal included), and twice the greatest height of the body.

The snout, which has the usual Trichiurid form, is two-fifths of the head in length, and twice the diameter of the eye.

The nostrils are small pores situated well in front of the eye. The mouth is large, and the upper jaw-bones are massive: the maxilla reaches to a point midway between the anterior border of the orbit and the pupil There is a single row of distant fang-like teeth in the premaxillary, which in front, to the number of three or four, are of great size: the mandibular teeth are similar in size form and arrangement, but only two—the front one on each side—are enlarged, and these but slightly. There is a single row of small sharp distant teeth on each palatine. Gill-opening extremely wide. Pseudobranchiæ large.

The head and body are invested in a thick silvery scaleless skin. The lateral line bifurcates at the level of the 5th or 6th dorsal spine, the upper branch running along the base of the dorsal fin, the lower descending with a curve to the middle line, or a little ventrad of it, and then taking a somewhat sinuous course to the caudal.

The longest (middle) spines of the long first dorsal fin are two-thirds the greatest body height in length: the second dorsal, like the anal, is low and short. the two spurious finlets are incompletely isolated in both fins.

The caudal is large and deeply forked.

The delicate pectorals are not quite half as long as the head The ventrals, which arise close together on the abdominal profile a little in advance of the pectorals, are each reduced to a single fluted spine

In correlation with the strong jaws and large fangs the stomach is huge, its length being one-third of the total (caudal included) In the specimen dissected there is a small air-bladder and seven large but delicate pyloric cæca.

Colours in spirit burnished silver, with the mid-dorsal line, from snout to caudal, blue-black: fins hyaline, the spinous dorsal with a black edge which is broadest in front, the tips of the lobes of the caudal fin dusky.

The largest specimen measures 5·25 inches.

Loc. Bay of Bengal, Station 162, 145/250 fathoms. This species has the true bathybial *facies.*

Family **Trachinidæ.**

Group Trachinina.

BEMBROPS, Steindachner.

Bembrops, Steindachner, SB Ak Wien, 1877, Vol. LXXIV, pt. i., p. 211.
Bathypercis, Alcock, J. A S. B. 1893, Vol. LXII, pt. ii, p. 177.

5 *Bembrops caudimacula*, Stdr.

Bembrops caudimacula, Stdr, SB Ak Wien, 1877, Vol. LXXIV, pt i, p 212.

Two small specimens of this species were dredged in the Bay of Bengal, at Station 170, 107 fathoms, this being the first report of the occurrence of the species in Indian waters

6 *Bembrops platyrhynchus*, (Alcock).

Bathypercis platyrhynchus, Alcock, J. A. S B, 1893, Vol. LXII., pt. ii, p 178.

Bay of Bengal, 128 fathoms.

I must apologize to Professor Steindachner for having, when describing this species last year, overlooked his very clear and complete account of his new genus *Bembrops* from Japan, and I must now state that *Bathypercis* is merely a synonym of *Bembrops*, and must be withdrawn.

Family **Pediculati.**

LOPHIUS, Art

7. *Lophius lugubris*, n. sp.

Very closely allied to *L. mutilus*, mihi.

B. 6. D 3/1/7-8. A. 5-6 C. 8 P. 13. V. 1/5.

Cephalic disk subcircular, its diameter not quite one-half the total (caudal included) · its upper surface studded with scattered knobs and spines, none of which are of predominant size the mouth-cleft traverses the whole breadth of the disk.

Depressible fangs in a single series along the premaxillary, except at the symphysis, where there are also a few small teeth of a second series; and in three irregular series in the mandible. A single rigid fang, or a pair, at either extremity of the head of the vomer, and an uneven row of 4 or 5 rigid fangs along each palatine

Eyes small, their major diameter being about one-seventh the length of the head: two diameters apart. Gill-cleft contracted: three gills The skin is loose and glandular, and round the edge of the disk and along the sides of the tail there is a scanty fringe of cutaneous filaments. The dorsal spines are simple filaments, the first two of which stand close together on the snout: the third is about twice the length of the second and as long as the cephalic disk in the after half of which it arises The second part of the spinous dorsal is represented by a single filament about two eye-lengths long, arising near the hinder limit of the cephalic disk.

Colours in spirit very dark sepia mottled with black tongue dusky. Length 4 25 inches

Loc. Station 151, off Colombo, 142 to 400 fms.

This species is very closely related to *Lophius mutilus*, mihi (J A. S. B., Part II of 1893; and Zoology of the R. I M S 'Investigator', Fishes, Part II, pl X, fig 2), from which it chiefly differs in having the second part of the spinous dorsal fin represented by a single well-developed spine, instead of by two hidden rudiments.

HALIEUTÆA, C. & V.

8 *Halieutæa fumosa*, n. sp

B. 6. D. 4. A 4. C. 9. P 13 V. 5.

Body remarkably thin and depressed. The greatest length of the cephalic disk, which is half the total, caudal included, is only four-fifths of its greatest breadth.

The spines on the dorsal integument, with the exception of those along the rostral and supra-orbital margin and those on the edge of the disk and along each side of the tail, are mere spicules, quite different from the large stellate spines of the other species, and the ventral integument is thick, soft and glandular, and is absolutely smooth. The cleft of the mouth is two-fifths the breadth of the wide disk

Eyes large, their diameter being between one-seventh and one-eight the length of the cephalic disk. interorbital space very slightly concave

The caudal fin is half the length of the tail, or one-fourth the total, itself included, and is equal in length to the pectorals: the long narrow ventrals are just over two-thirds the length of the pectorals.

Colours in spirit upper surface smoky blue becoming hyaline round the edge of the disk, under surface hyaline, finely and closely speckled with silver: dorsal fin blackish: pectorals and caudal broadly and darkly banded in the distal half, and often milk-white at tip: numerous fine jet black filaments on the upper surface of the disk: a black ring round the orbit.

The largest specimen—a mature female—is about 4 inches long, and 2·4 inches across the disk.

Loc. Bay of Bengal, Station 162, 145 to 250 fms.

SYNOPSIS OF THE INDIAN SPECIES OF *Halieutæa.*

I. Disk markedly broader than long, with the spinature of its dorsal surface remarkably feeble, and with the skin of its ventral surface soft, thick, glandular and absolutely smooth.

[Interorbital space rather broad and very slightly concave: eyes large: mouth-cleft wide, two-fifths of the width of the very wide disk: four rays in the dorsal fin: colour smoky blue].—*H. fumosa.*

II. Disk nearly circular, or only slightly broader than long, with the spinature of its dorsal surface strong and coarse, and with the skin of its ventral surface leathery and either spiny or granular.

- i. Under surface of disk granular or with scattered spines: interorbital space rather narrow and markedly concave: eyes small.
    - *a.* Under surface of disk with scattered spines between which the skin is rough: cleft of the mouth narrow, about one-third the width of the disk: four rays in the dorsal fin: ventral fins broad: colour pink.—*H. stellata, C. & V.*
    - *b.* Under surface of disk finely and very closely and uniformly granular: cleft of the mouth broad, nearly half the width of the disk: five rays in the dorsal fin: ventral fins long and slender: colour blue-black.—*H. nigra.*
- ii. Under surface of disk closely covered with stellate spines: interorbital space rather broad and slightly concave in front only: eyes large.

  [Mouth-cleft wide, nearly half the width of the disk: five rays in the dorsal fin: ventrals broadish: colour crimson to bright pink].—*H. coccinea.*

Family Cataphracti.

PERISTETHUS, Lacép.

9. *Peristethus Rivers-Andersoni*, n. sp., Pl. VI., figs. 2, 2a, 2b.

D. 6/22 A. 21. L. lat. 32.

The pre-orbital processes, which are bluntly pointed depressed and hollow—their cavity opening below by several large pores—are in length nearly half the distance between their tip and the anterior border of the orbit, and each has upon its base a small upstanding hook.

The pre-opercular ridge is remarkably salient but is sharply truncated, not forming a spine. The opercular ridge forms a short bluntly rounded spine.

The lower jaw is thickly fringed with small tentacles. The labial tentacles when laid back hardly surpass the angle of the mouth.

The interorbital space, the breadth of which is equal to the major diameter of the orbit, is deeply concave, and is traversed fore and aft by a deep median groove Each supra-orbital margin is surmounted posteriorly by a strong recurved spine, and there is a similar spine on each side of the occiput

The body-shields are in four rows on each side · each shield is strongly carinated, the carina being produced behind into a strong spine, and in the case of the shields of the posterior third of the lateral line the carinæ are slightly produced and pointed in front also.

The length of the anterior ventral shields is more than twice their greatest breadth.

Colours in spirit: body flesh-coloured, the pectorals with a broad jet-black band in their posterior half and with a milk white tip; the spinous dorsal black in its upper half, and the soft dorsal with a black edge.

Length 3·5 inches.

Loc. Station 151, off Colombo, 142 to 400 fms.

ANACANTHINI.

Family Gadidæ.

PHYSICULUS, Kaup.

10. *Physiculus argyropastus*, Alcock.

Physiculus argyropastus, Alcock, J. A. S. B., 1893, Vol. LXII, Pt. ii, p. 180, pl. IX, fig. 2.

Several specimens were dredged in the Bay of Bengal at 162 and 170 fathoms.

This species is easily distinguished from *Physiculus roseus*—the only other Indian species—as the following tabular statement shows:—

COMPARISON OF THE INDIAN SPECIES OF *Physiculus*.

Physiculus roseus.	*Physiculus argyropastus.*
Greatest height of the body a little over one-sixth of the total (with caudal)	Greatest height of the body a little over one-seventh the total (with caudal).
Jawbones broad and massive	Jawbones thin and narrow.
Barbel stout and fleshy, about as long as the eye.	Barbel filiform and inconspicuous, never half the length of the eye
First ray of first dorsal fin prolonged.	No prolonged dorsal ray
Seven ventral rays, the longest, (outermost) of which only just surpasses the origin of the anal.	Six ventral rays, the longest (outermost) of which reaches to the 12th or 13th anal ray
Uniform rose red.	Body with a reddish tinge; fins scarlet.

Family **Ophidiidæ.**

GLYPTOPHIDIUM, Alcock

11. *Glyptophidium macropus*, n sp, Pl. VI., fig 3

In character quite similar to *Glyptophidium argenteum* (Ann Mag Nat. Hist, Nov. 1889, p 390, and Zool. H M. I M S 'Investigator,' Fishes, Part I., Pl. II, fig. 3), from which it differs chiefly in having the ventral fins in the form of bifid instead of simple filaments, and in having the caudal fin confluent with the other vertical fins instead of being free a short distance from its base.

The head, which is higher than, and nearly twice as long as the trunk proper, is nearly one-fourth of the total, and has the muciferous channels greatly developed, but the frill-like crests which delimit them —with the exception of the one in the middle line—low. The short trunk falls abruptly to the low finely tapering tail.

The snout, which does not overhang the equal jaws, is a trifle more than one-fourth the length of the head, and not quite equal to the major diameter of the large subcutaneous eye, which latter is equal to the breadth of the interorbital space.

Mouth-cleft wide, the maxilla reaching beyond the middle of the eye: the jaw-bones, like all the bones of the head, are extremely delicate. Villiform teeth in very narrow bands in the jaws, palatines, and vomer.

Operculum with a feeble spine above: gill openings very wide, the gill-membranes being separate throughout: gill-laminæ very narrow: gill-rakers on the outer side of the first arch numerous (over 25 in number), close-set, long, setiform: pseudobranchiæ moderately large. Scales small and extremely thin; larger and even thinner, but sparse and deciduous, on the head. No lateral line whatever.

The dorsal fin begins well on the occiput, and is much more developed than the anal, its rays in its anterior two-thirds being more than half of the greatest body-height in length: the caudal, which is only about one-third the length of the head, is confluent with the other vertical fins. Pectorals large and pointed, with a thick fleshy base: their length is nearly equal to that of the postrostral portion of the head. The ventrals arise close together at the pectoral symphysis: each consists of two long rays, the inner of which is an eye-length longer than the head.

Intestine long and much convoluted. 7 or 8 very small pyloric cæca: a large air-bladder.

Colours in spirit head and eye and body silvery, the body finely peppered with black. vertical fins hyaline with blackish tips, pectorals blackish, ventrals white.

The largest specimen is nearly $5\frac{1}{2}$ inches long.

Loc. Bay of Bengal, Station 162, 145—250 fms.

NEOBYTHITES, Goode and Bean.

12. *Neobythites squamipinnis*, Alcock.

Pycnocraspedum squamipinne, Alcock, *Annals and Magazine of Natural History*, November 1889, p. 386.

Further specimens (from the Bay of Bengal 145–250 fms.), together with a better knowledge of the family, convince me that the characters upon which the genus *Pycnocraspedum* was founded are not of generic value. I therefore withdraw the name *Pycnocraspedum.*

Family **Macruridæ.**

MACRURUS, Bl.

Subgen. Cœlorhynchus.

13. *Macrurus flabellispinnis*, n. sp.

B. 6. D.*1/8. A. 95. P. 16. V. 7. Pyl. cæc. *circ.* 40.

Head massive, shark-like, deeper and broader than, and more than twice the length of the trunk proper, and more than half the length of the lash-like tail: its length in the total is nearly one-third.

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* A rudimentary tubercle.

The trihedral, rigid, and acutely-pointed snout is about two-fifths the length of the head, and about twice the major diameter of the large eye in length about four-fifths of its extent is pre-oral. The nostril on either side has the form of a large pit (the vertical diameter of which is two-fifths the major diameter of the eye) with an anterior circular opening, and the posterior opening much larger and reniform—the two openings being separated by a narrow bridge of skin.

The mouth is quite inferior the maxilla reaches almost to the vertical through the posterior border of the orbit Villiform teeth in a narrow tapering band in the lower jaw; and in a broader and longer band in the upper jaw, where the outer row is slightly enlarged. Barbel slender, not much more than half an eye-length long.

Gill-openings wide, the membranes free gill-rakers rudimentary. gill-laminæ large and broad

The body and the head, except in the glosso-hyal region, are everywhere covered with large, stout, firmly adherent scales: those on the head, which are so intimately adherent to the bones beneath as to form a plate-armour, are furnished with from three to eight strong widely-radiating spiniferous ribs, while those on the body and tail have usually eight similar great spiniferous ribs, the radiate arrangement of which, though very distinct, is not quite so marked occasionally the last spine of one rib or more projects beyond the edge of the scale

There are four rows of scales between the base of the first dorsal fin and the scales of the lateral line.

The first spine of the first dorsal fin is a mere tubercle; the second, which is not quite five-sixths the length of the snout, is smooth throughout · the interval between the two dorsal fins is greater than the extent of the base of the first The pectorals are narrow and pointed, and their length is not quite equal to that of the postorbital portion of the head. The outer ray of the ventrals is prolonged, but is not quite equal in length to the longest pectoral ray.

Stomach large and siphonal · at least 40 large long pyloric cæca air-bladder small, and with a thin wall.

Colours: dark stone-grey; fins and pharyngo-branchial walls blue-black; parietal peritoneum silvery-grey.

Length 19 inches

Loc. Station 150, Laccadive Sea, 719 fms

This species is very closely allied to *M. japonicus* Schleg., *M parallelus*, Gthr, and *M quadricristatus*, mihi

Subgen. **Macrurus**, Bl.

14. *Macrurus pumiliceps*, n. sp.

Closely allied to *M. smiliophorus*, Vaillant, from which it differs conspicuously in the structure of the scales

B 7. D. 2/11. V. 12. P. 18.

The length of the head, which is a little more than the greatest height of the body, is only just over one-eighth of the total, the tail forming a long lash.

Snout trihedral, with strong median and lateral tubercles, its length is just exceeded by the major diameter of the eye,—the latter being not quite one-third the length of the head, and exceeding the width of the interorbital space by about one-fourth

Mouth small and quite inferior, the maxilla only just passing the level of the front border of the orbit Barbel about three-quarters the length of the eye Villiform teeth in bands in both jaws.

Head and body covered with small scales, those on the head with rough radiating ridges, those on the body having usually six (sometimes, eight) nearly parallel rows of long slender spinelets — not more than five in the longest row [In the specimens taken no lateral line is distinguishable]

The first dorsal spine is rudimentary, the second is slightly elongate (not so long as the short head), and very closely and sharply serrated (about 35 serrations) except at extreme base and tip. The rays of the second dorsal fin are remarkably short, slender, and inconspicuous, those of the anal are remarkably long and stout The outermost ventral ray is moderately prolonged, being as long as the upper pectoral rays, or equal in length to the postrostral portion of the head [In the two immature specimens taken the ventral reaches to the sixth anal ray, and the pectoral to the ninth, the vent being not half an eye-length behind the base of the pectoral fin]

Nine or ten villiform (rudimentary) pyloric cæca.

Colour silvery grey, throat, gill-membranes, belly, and paired fins black; vertical fins blackish.

Length 11 inches

Loc. Laccadive Sea, Station 150, 719 fms.

THE INDIAN SPECIES OF *Cœlorhynchus* and *Macrurus*.

1. *Key to the Indian Species of the Sub-genus* Cœlorhynchus

- I Scales of the body with distinctly *radiating* spiny ridges, all of which are uniform in size and spinature pyloric cæca about forty in number.
  - 1 Scales of the body with not more than five spiny ridges six rows of scales between the after limit of the first dorsal fin and the lateral line body with numerous cross-bands —*Macrurus* (*Cœlorhynchus*) *quadricristatus*.
  - 2 Scales of the body with usually eight spiny ridges four rows of scales between the after limit of the first dorsal fin and the lateral line colour uniform dark stone-grey *Macrurus* (*Cœlorhynchus*) *flabellispinis*.
- II Scales of the body with *parallel* spiny ridges, the spinature of the middle one of which is by far the strongest pyloric cæca twelve in number .... 3 *Macrurus* (*Cœlorhynchus*) *parallelus*, Gthr

2. *Key to the Indian Species of the Sub-genus* Macrurus

- I Six branchiostegals: [seven to nine rays in the ventral fin].
  - 1 Second spine of the first dorsal fin remarkably prolonged—more than twice the length of the head eight rays in the ventral fin.
    - i Scales small, with five or six well-spaced parallel rows of spinelets *Macrurus* (*Macrurus*) *lophotes*
    - ii Scales large, with about seventeen oblique crowded rows of spinelets *Macrurus* (*Macrurus*) *macrolophus*.
  - 2 No greatly prolonged spine in the dorsal fin seven to nine rays in the ventral fin.
    - i Scales with rows of spinelets all of which are of uniform small size greatest height of the body much exceeding that of the tail
      - *a* Seven rays in the ventral fin snout blunt —not longer than the eye .. .. *Macrurus* (*Macrurus*) *hextii*.
      - *b* Eight rays in the ventral fin snout sharp—longer than the eye *Macrurus* (*Macrurus*) *wood-masoni*.
    - ii Scales with rows of spinelets of which those in the middle row are conspicuously larger than the others body not abruptly delimited from the tail nine rays in the ventral fin ...*Macrurus* (*Macrurus*) *hoskynii*.

II. Seven branchiostegals [eight to twelve rays in the ventral fin].

- 1. Usually eight rays in the ventral fin scales with spinelets which may be in rows or not, but are never densely packed.
  - i Mouth very large snout remarkably shallow. barbel considerably longer than the eye spinelets of the scales without any arrangement a patch of enlarged cycloid scales behind the first dorsal fin cheeks opercles and belly burnished silver ventrals eight-rayed .. . . *Macrurus* (*Macrurus*) *petersoni.*
  - ii. Mouth very small snout deep barbel not half as long as the eye spinelets of the scales arranged in definite rows: opercles and belly black ventrals eight-rayed ..... *Macrurus* (*Macrurus*)* *investigatoris.*
- 2 Ten rays in the ventral fin scales with densely packed spinelets which show no arrangement in rows snout quite peculiar in being vertically truncated with an abruptly prominent median tubercle—its length without the tubercle being not much more than half that of the eye *Macrurus* (*Macrurus*) *brevirostris.*
- 3 Usually twelve rays in the ventral fin scales with rows of spinelets which may be either close-set or open
  - i Tail lash-like and filiform · spinelets of the scales in definite short rows eight or nine in number
    - *a* Head large—its length about one fifth of the total. gill-openings extremely wide, the membranes being united only quite in front ventrals (eleven or) twelve rayed ... *Macrurus* (*Macrurus*) *polylepis.*
    - *b* Head singularly small—its length about one-eighth the total gill-openings of the usual width, the membranes being broadly united ventrals with twelve rays....... . *Macrurus* (*Macrurus*) *pumiliceps.*
  - ii Body of the usual tapering form spinelets of the scales in densely crowded rows fifteen in number besides short rows in between ventrals (eleven or) twelve rayed .. . .*Macrurus* (*Macrurus*) *semiquincunciatus.*

BATHYGADUS, Gthr.

15. *Bathygadus furvescens*, n. sp.

B. 7. D. 10. P. 15. V. 8. Pyl. cæc 20.

The length of the head is a little more than one-fifth of the total (1: 4·75), and the height of the tapering body, immediately behind the gill-opening, is about three-fourths the length of the head.

The length of the snout is one-fourth that of the head, and is equal to the width of the interorbital space · the major diameter of the orbit is four-fifths the length of the snout. The nostrils are placed close together immediately in front of the eye, the anterior being a mere pore.

The mouth is very capacious, its cleft reaching to the vertical through the posterior border of the orbit. Villiform teeth in bands in the jaws only, the band in the upper jaw being very broad · there is a wide diastema between the two elements of the pre-maxillary, and a corresponding but much narrower edentulous interval at the mandibular symphysis. There is no barbel.

Gill-openings wide, the gill-membranes free The gill-rakers are short, broad, clavate and remarkably spiny, except on the outer side of the 1st branchial arch where they are long and setiform,—the middle ten or twelve being three-fourths the diameter of the eye in length.

The body and the head, except in the glosso-hyal region, are covered with deciduous cycloid scales, of which there seem to be seven rows between the base of the 1st dorsal fin and the lateral line.

The 1st dorsal fin has the usual position, and the 2nd arises immediately behind it an unbroken ray from the middle third of the well-developed 2nd dorsal is more than one-third of the greatest body-height in length The rays of the anal fin are short and slender The length of the pectorals is not quite equal to that of the postrostral portion of the head · when laid back, their tips reach beyond the origin of the anal. The ventrals, which are large, arise immediately below the pectorals.

The pyloric cæca, which are twenty in number, are of great size, as is also the pancreas. The air-bladder is large and spongy.

Colours warm dusky brown, vertical fins blackish, paired fins black; gill-membranes, mouth and peritoneum black.

Length. 20·5 inches.

Loc Station 150, off the Maldives, 719 fms.

Family **Pleuronectidæ.**

CHASCANOPSETTA, n. gen.

Mouth very wide, the maxillary being more than half the length of the head. Jaws and teeth equally developed on both sides, each jaw being armed with a single row of long slender depressible teeth. Eyes on the left side The dorsal fin commences near the tip of the snout, its rays, and those of the anal, being simple, slender, and scaleless. Scales minute, membranous, hardly imbricate Lateral line with a strong curve above the pectoral Gill-openings wide, the gill-membranes united to the isthmus in front Gill-rakers none

16 *Chascanopsetta lugubris*, n. sp., Pl. VI., fig. 4.

B. 7. D 115. A. 80. C. 16 V 6.

Body long, low, tapering, the dorsal profile considerably more convex than the ventral. The greatest height of the body is about one-fourth, and the length of the head about one-fifth of the total, caudal included.

Mouth-cleft very wide, oblique, with the lower jaw strongly projecting the maxilla, which is hardly expanded posteriorly, is about three-quarters the length of the head,—reaching nearly to the angle of the properculum Each jaw is armed with a single row of sharp curved teeth of two sizes, the larger fairly regularly alternating with the smaller those of the lower jaw are very close-set, and are strongly depressible inwards across the floor of the mouth those of the upper jaw are more distant, not so strongly depressible, and rather smaller Tongue large, free, with a long styliform point.

The eyes, which are on the left side, are large (their major diameter being about two-sevenths of the length of the head), close-set (less than a-third of a diameter apart), and nearly equal in front The snout proper is short—about two-thirds the length of the eye The nostrils are minute pores situated in front of the interorbital space

The gill-openings are wide, the gill-membranes being free posteriorly the gill-arches are extremely weak and slender, the gill-laminæ are delicate, and there are no gill-rakers.

The body and the post-orbital portion of the head are covered with minute membranous hardly imbricating scales, which are somewhat enlarged along the lateral line The lateral line on both sides has a strong sinuous curve above the pectoral fin.

The fin-rays are weak and filiform · the dorsal begins in front of the eye, on the snout The caudal peduncle is strongly constricted, and expands again at the insertion of the fin, which is long and pointed,—6½ in. the total length. The pectorals are slender that on the coloured side is much larger than its fellow, its upper rays being nearly as long as the caudal. Both ventrals are well developed.

Colours · dull dusky brown, the peritoneum showing through as a black patch, iris and fins black, tongue dusky brown.

The largest specimen is 5 75 inches long

Loc. Bay of Bengal, Station 162, 145 to 250 fms.

POECILOPSETTA, Gthr

17 *Poecilopsetta maculosa*, n sp, Pl VII, fig 1.

D 56 A 46 V. 5. C 18

Height of the body about $1\frac{4}{5}$ in the total, without caudal, length of the head a little more than $3\frac{1}{2}$ The length of the snout is about half the major diameter of the lower eye, which latter is nearly one-third the length of the head—the upper eye being markedly larger. The eyes are on the right side, the lower hardly in advance, the upper strongly encroaching on the dorsal profile they are separated by a flat scaly space, the breadth of which is nearly equal to the length of the snout The mouth-cleft is oblique and narrow, the maxilla being hardly more than one-fourth the length of the head the jaws are equal in front and equally developed on both sides, as are the teeth, which are villiform and in a crowded row in both jaws The gill-membranes are broadly united below the throat

The head, body, and caudal fin are covered with minute thin cycloid scales the lateral line has a wide curve above the pectoral fin The dorsal fin begins above the middle of the eye and extends to the base of the caudal peduncle· its rays, like those of the anal fin, are simple, the longest being less than one-fourth the greatest body height The caudal fin is large and hastate, its length being nearly one-fourth the total The right (coloured) pectoral is rather more developed than the left, but is not longer than the eye The ventrals are quite equal, opposite, and symmetrical, and are about as long as the eye

Colours right side silvery-grey with numerous large, well-defined, more or less oval blotches, varying from dusky grey to jet-black—the black blotches, in regular alternation with lighter ones, forming a ring round the circumference of the body, pectoral with a black blotch, caudal with two—one above, the other below left side with several longitudinal series of black blotches along the middle of the body, and with a series round the circumference of the body, corresponding blotch for blotch with those on the coloured side.

Length nearly 3 75 inches

Loc Bay of Bengal, Station 162, 145–250 fms.

18. *Pœcilopsetta prælonga*, n sp, Pl VII, fig 2.

D 58–60 A 45–47. V. 6 C. 18

Closely resembling *P maculosa*, but very easily distinguished by the following differences —The height of the body is only about one-third of the total without the caudal the length of the snout is only about one-third the major diameter of the eye, which is one-third the length of the head the eyes are in the closest contact the maxilla is one-third the head in length the teeth are in a narrow but distinct band in either jaw the dorsal fin begins above the hinder limit of the upper eye, and its longest rays are over one-third the greatest body-height in length the caudal fin is narrow elongate and pointed.

Colours · right side hyaline grey, all the fins black, a series of black blotches round the circumference of the body, and two series along the middle of the body the left side is coloured very much as in the preceding species

The largest specimen measures 3 75 inches

Loc Off Colombo, Station 151, 142–400 fms.

SOLEA, Gthr.

19 *Solea umbratilis*, n sp, Pl VII, fig 3

D 70 A 50 C 18 P 0. V 5 L. lat circ. 80*

The height of the body is $2\frac{1}{3}$ in the total without the caudal The length of the head is sometimes a little more, sometimes a little less than a third of the total without the caudal (in adults) The snout is but slightly hooked its length is twice that of the eye and from two-sevenths to a quarter that of the head The eyes are nearly or quite a diameter apart The nostril of both sides is a slender tube The mouth-cleft reaches to the posterior limit of the lower eye

No pectoral fins whatever.

Ventral fins symmetrical, separated from the anal by more than an eye-length

Colours in spirit warm olive brown with numerous large black blotches which form four or five irregular transverse series and three irregular longitudinal series dorsal and anal fins bluish-black or black underside smoky in rather more than the posterior half The black blotches are sometimes circumscribed by a light areola

Length of a nearly mature female, 4 25 inches

Loc Bay of Bengal, Stations 169 and 170, 91–107 fms

In form and colour this species at first sight resembles *Solea cyanea* (Ann Mag Nat Hist, Dec. 1890, p 439), from which it is distinguished—specimens of equal size being compared—by the much larger head and mouth, by the larger and more widely separated eyes, and by the fewer rays in the dorsal and anal fins It is however closely allied to *Solea cyanea*, and also to *Solea melanosticta*, Peters (MB. Ak

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* To its termination behind the upper eye.

Berl., 1876, p. 845), and *Solea kaiana*, Gthr. ('*Challenger*' Shore fishes, p. 49, pl. XXI, fig C.)—all being comparatively deep-water forms of the East Indian Seas

APHORISTIA, Kaup

20 *Aphoristia trifasciata*, n. sp, Pl VII., fig. 4.

D 87–89. A 75–77 V. 4. C. 12. L. lat 80 to 82. L tr. 38 to 40

The length of the head, which is a trifle less than the height of the body, is one-fourth the total without the caudal. The length of the snout, which is about one-third more than the major diameter of the eye, is from one-fifth to one-sixth the length of the head The eyes are in contact and are situated between the same verticals. The cleft of the mouth reaches beyond the middle of the lower eye. A row of small equal setiform teeth in each jaw on the blind side The nostrils, the gill-openings and gill-membranes, and the form and arrangement of the scales, are as in the other Indian species.

The longest (posterior) rays of the dorsal fin are more than half the greatest body-height, the corresponding anal rays being not quite so long. The ventral fin is about one-fourth the length of the head, and is separated from the anal by an interval equal to the length of the snout

Colours. warm olive brown with three broad blackish cross-bands

The largest specimens measure 4 to $4\frac{1}{2}$ inches.

Loc. Bay of Bengal, Station 162, 145–250 fms., and Station 164; 195–210 fms

This species is akin to *Aphoristia septemstriata* and to *Symphurus leei*, Jordan and Bollman, *Symphurus fasciolaris*, Gilbert, and *Symphurus atramentatus*, Jordan and Bollmann. Its difference from the other Indian species, all of which also inhabit deep water, is shown in the following synoptical table

SYNOPSIS OF THE INDIAN SPECIES OF *Aphoristia*

I Both sides coloured, no cross stripes height of the body rather over one fourth the total (with caudal)	1. The mouth-cleft extends to or beyond the middle of the lower eye, owing, not to the greater size of the mouth, but to the more anterior position of the eyes the origin of the ventral fin is hardly an eye-length distant from that of the anal. .. .. *A gilesii*.
	2 The mouth-cleft, owing to the more posterior position of the eyes, hardly surpasses the front edge of the lower eye the origin of the ventral fin is more than two eye-lengths distant from that of the anal. ... *A. wood-masoni*.

II. Only the left side coloured, striped with cross-bands. height of the body markedly less than one fourth the total (with caudal)

1. The length of the head is one-fourth the total (without caudal) · mouth-cleft large, reaching well beyond the middle of the lower eye. the largest rays of the vertical fins are more than half the greatest body-height three cross-bands .... *A. trifasciata.*

2. The length of the head is one-fifth the total (without caudal) mouth-cleft small, hardly surpassing the front edge of the lower eye the longest rays of the vertical fins are from two-fifths to one-third the greatest body height six or seven cross-bands ... *A septemstriata.*

PHYSOSTOMI.

Family **Scopelidæ.**

CHLOROPHTHALMUS, Bonap.

21. *Chlorophthalmus corniger*, n. sp, Pl. VI, fig 5.

B 8. D. 11. A. 9. P 14. V. 1/8. L lat. *circ* 55

Closely allied to *Chlorophthalmus productus*, Gthr ('Challenger' Deep-Sea Fishes, p 193, pl. L., D.), from which it appears to differ only in colour, and in having a pair of strong flat spines on either side of the salient mandibular symphysis.

Colours in spirit silvery-grey with numerous broad ill-defined dusky cross-bands fins hyaline, the tip of the caudal and the base and tip of the dorsal black.

The largest specimen measures a little over 3 inches.

Loc. Bay of Bengal, Station 152, 145–250 fathoms.

Family **Murænidæ.**

Group Anguillina.

CONGROMURÆNA, Kaup

22. *Congromuræna musteliceps*, n. sp, Pl. VII., fig 5.

Allied to *C. megastoma*, Gthr., *C. squaliceps*, *C. nasica* and *C. macrocercus* (= *C. longicauda*, Alcock, *nec* Ramsay and Ogilby).

Head about an eye-length longer than the trunk, which is one-fourth the length of the tail.

The snout, which is long narrow and acutely pointed and far over-hangs the mouth, is between one-fourth and two-ninths the length of the head, and twice the major diameter of the eye. The anterior nostril is a short tube situated on the lip near the tip of the snout, the posterior is a very wide foramen situated above and in front of the angle of the eye. The mouth-cleft reaches just behind the vertical through the middle of the eye, and the lips are large. Minute teeth in broadish bands in the jaws, in a rasp-like patch outside the closed mouth in the pre-maxillary, and in a broad band in about the anterior third of the vomer Gill-openings wide, separate.

No scales the lateral line is marked by a row of small pores

Pectorals narrow, pointed, nearly half an eye-length longer than the snout Vertical fins confluent, the dorsal beginning nearly an eye-length in advance of the gill-opening

Colours in spirit dark purple-brown, becoming silvery on the abdomen · opercle black vertical fins with a broad black edge throughout their entire length.

The largest specimen measures 15 inches

Loc Bay of Bengal, Station 162, 165–250 fathoms.

SYNOPSIS OF THE INDIAN SPECIES OF *Congromurana*

I Head much shorter than the trunk proper tail but little longer than the head and trunk combined,—*C anago*, Schleg

II Head nearly equal in length to the trunk proper tail nearly twice as long as the head and trunk combined —

i Snout narrow, and tapering to a very sharp point,—its length between one-fourth and two ninths that of the head cleft of the mouth not extending much beyond the middle of the eye,—*C musteliceps*

ii Snout broadish or broad, and blunt pointed cleft of the mouth extending much beyond the middle of the eye —

a Snout one fifth the length of the head, its mucous channels opening by small and inconspicuous pores pectorals large, much longer than the snout,—*C squaliceps*

b Snout one fourth the length of the head, its mucous channels opening by large and conspicuous pores pectorals small, about as long as the snout

1 Eye in the adult half the length of the snout one or two of the vomerine teeth conspicuously enlarged,—*C nasica*

2 Eye in the adult about two-thirds the length of the snout no enlarged teeth on the vomer,—*C macrocercus* (= *C longicauda*, Alcock, *nec* Ramsay and Ogilby.

Group Muraenesocina.

XENOMYSTAX, Gilbert

Gilbert, Proc U S Nat Mus, Vol XIV, 1891, p 318

23 *Xenomystax trucidans*, n sp.

Head about equal in length to the trunk, the latter being about two-sevenths the length of the long tapering tail.

The depressed and sharply pointed snout is a little more than one-third of the head in length and nearly four times the major diameter of the eye its mucous pores, like those of the mandible and of the rest of the head, are large slits the anterior nostril is a large sub-tubular slit situated on the lip close to the tip of the snout, the posterior is a wide elliptical foramen situated, almost superiorly, partly in the posterior and partly in the middle third of the snout. The mouth-cleft is wide, extending an eye length behind the posterior border of the orbit, or more than half way along the head, and the maxillæ are most remarkably massive The teeth are in broad crowded bands, acicular or caniniform, and for the most part depressible those in the upper jaw are in two bands—an outer very broad-band of large depressible teeth in four series which increase in size from without inwards, and an inner narrow-band or very close-set row of small rigid teeth—the two bands being separated throughout their whole extent by a broad groove the pre-maxillary teeth, which are much enlarged, are in a broad patch standing outside the closed mouth the mandibular teeth are in at least five series increasing in size from without inwards, and at the symphysis, where they are greatly enlarged, they form a patch which fits into a wide notch in the upper jaw · the vomerine teeth form a short row of fangs. Tongue small and intimately adherent throughout to the floor of the mouth. Skin scaleless, glandular Lateral line formed by a row of large brilliant close-set pores. Gill-openings wide, crescentic, separated by a very narrow interspace

Vertical fins well developed, the dorsal beginning just in advance of the gill-opening. Pectorals narrow, pointed, more than half the snout in length.

The stomach is large, extending the whole length of the abdominal cavity, and is very distensible the intestine in its posterior portion is coiled in a series of close pleats only the left lobe of the liver is developed pancreas large a large air-bladder extending behind the vent.

Colour body and fins blue-black, pectorals with narrow whitish edge and tip margin of gill-opening and of all the mucous pores of the head and lateral line brilliant white

A mature female between 25 and 26 inches long

Loc. Laccadive Sea, Station 150, 719 fathoms

This species appears to differ from *Xenomystax atrarius*, dredged by the U S Fish Commission in 401 fathoms off the coast of Ecuador, only in the greater relative length of the tail, the nearer approximation of the gill-openings, and the greater length of the pectoral fins.

Group Nemichthyina.

NEMICHTHYS, Richardson.

24. *Nemichthys acanthonotus*, n sp.

The posterior third or so of the long slender body is rather abruptly constricted to form a lash-like tail.

The head, rather more than four-sevenths of which is formed by the long tapering snout, is between one-seventh and one-eighth of the total. The diameter of the subcutaneous eye is between one-third and one-fourth the length of the post-orbital portion of the head, and between one-sixth and one-seventh the length of the snout The nostrils have the usual position, and the jaws are curved at tip as in *N. infans.* Small recurved asperities in crowded bands form the dentition of the jaws and vomer.

The vent is situated immediately behind the gill-opening and the root of the pectoral fin.

The gill-openings, which are wide, are separated from one another only by a thin fold of skin.

No scales. The lateral line is marked by a series of small glistening pores which are arranged with beautiful regularity in "fives" (quincunces) The head is studded with similar pores

The dorsal fin commences on the occiput, and is continued to the tip of the tail in a part of its extent somewhat less than the middle third the long slender rays are replaced by strong short spines—like those of *Notacanthus*—interconnected by a low membrane The anal fin, which commences immediately behind the vent, has its rays well-developed throughout,—the longest rays being considerably more than half the length of the post-rostral portion of the head

The pectorals are large, and are half as long as the post-orbital portion of the head.

Colours uniform dark sepia becoming black ventrally gill-covers and fins black.

A single well-preserved specimen 22 inches long

Loc Bay of Bengal, Station 165, 475 fathoms.

This species is distinguished from its congeners by the long series of stout sharp close-set spines in the middle of the dorsal fin

Family **Halosauridæ.**

HALOSAURUS, Johnson

25. *Halosaurus mediorostris*, Gthr.

Halosaurus mediorostris, Gthr 'Challenger' Deep Sea Fishes, p. 239, pl. LIX, fig C

A single specimen was dredged in the Laccadive Sea, at Station

150, in 719 fathoms, and is now for the first time recorded in the Indian Fauna.

PLECTOGNATHI.

Family **Sclerodermi.**

TRIACANTHODES, Blkr.

26. *Triacanthodes ethiops*, n. sp., Pl. VII, fig. 6.

D. 6/14. A. 14. P. 11–12. V. 1/1.

In a young specimen the height of the body is one-half the total length—caudal included.

The integument is everywhere closely covered with acicular spinelets, each of which is deeply imbedded in a fleshy papilla. The first dorsal spine is of pre-eminent size,—more than half the height of the body, but is neither so long nor so stout as the single recurved spine of the ventrals. All the spines are armed with numerous small barbs. In the axil of each ventral spine is a single minute filiform ray.

Colours uniform blue-black, the spiniferous papillæ milk-white.

A single specimen not much over an inch and a half long.

Loc. Bay of Bengal, Station 162, 145–250 fathoms.

EXPLANATION OF PLATES.

PLATE VI.

Fig. 1.	Thyrsites bengalensis.
Figs. 2, 2a, 2b.	Peristethus rivers andersoni.
Fig. 3.	Glyptophidium macropus.
Fig. 4.	Chascanopsetta lugubris.
Fig. 5.	Chlorophthalmus corniger.

PLATE VII.

Fig. 1.	Poecilopsetta maculosa.
Fig. 2.	Poecilopsetta prælonga.
Fig. 3.	Solea umbratilis.
Fig. 4.	Aphoristia trifasciata.
Fig. 5.	Congromuræna musteliceps.
Fig. 6.	Triacanthodes ethiops.

Natural History Notes from the Royal Indian Marine Survey Steamer 'Investigator,' Commander C F Oldham, R N, commanding—Series II, No. 12 *Note on the sound produced by the Ocypode Crab*, Ocypoda ceratophthalma.

By SURGEON-CAPTAIN A R ANDERSON, B.A, M B, NATURALIST TO THE INDIAN MARINE SURVEY

[Received and Read 4th July]

Although in several Brachyurous Decapod Crustaceans stridulating ridges have been most carefully described and figured, in only one solitary instance can I find any observations regarding the sounds produced by these ridges Indeed they appear to have derived their designation rather from the resemblance they bear to the stridulating organs of insects than from any stridulating function they themselves had been observed to possess In this note I venture, therefore, to describe the sound produced by the well-known stridulating organ of *Ocypoda ceratophthalma*, Pallas, a description of which, as well as of the ridges found in such other species of *Ocypoda* as possess them, will be found given by Miers in the Annals and Magazine of Natural History Vol X, 1882 Dana, in the volume describing the *Crustacea* of the United States Exploring Expedition, writes of the genus *Ocypoda* — "These species are able to make a sound, by means of a series of minute ridges on the inner surface of the hand, which acts like a rasp against a prominent edge on the second joint of the same pair of legs" He however gives no description of the sound produced In the Administration Report of the Marine Survey of India for 1891-92, Surgeon-Captain A Alcock relates his experiences of the musical powers of the red *Ocypoda macrocera*, and with this solitary exception, I am unable to find any record of similar powers having been observed in any other of the Ocypodes

In *Ocypoda ceratophthalma* the stridulating organ consists of a ridge coarsely striated above, finely striated below, borne on the inner surface of the hand of the larger chela This ridge is rubbed across a smooth raised ridge on the ischium of the same chela, and by slowly rubbing the opposed ridges together, and placing the crab over the mouth of a wide-necked bottle to act, like the crab's burrow, as a resonator, an exact reproduction of the sound emitted by the crab, during life, can be obtained One bright hot sunshiny morning in November, as I was walking along the shore of Bingaroo, one of the Lakadive Islands, which is only occasionally visited by the inhabitants of the other islands of the same atoll, I was surprised to hear a loud croaking noise, that appeared to proceed from the edge of the scrub jungle that covers the island. At first I imagined it must be caused by frogs, so perfectly did it resemble the croaking of these animals. However, on tracing the sound to its source, I discovered that it proceeded from the burrows of the Ocypode crabs which here fringed the beach at high-water mark. These burrows are frequently, in coral sand, very wide at their mouths (6 to 8 ins.), and then taper gradually downwards, so that they act as excellent resonators. The cause of the stridulation of the crabs was by no means apparent, the animals were all lying hidden in their burrows, and several were croaking at the same time, as if in concert.

Natural History Notes from the Royal Indian Marine Survey Steamer 'Investigator,' Commander C. F. Oldham, R. N., commanding.—Series II, No. 13. *A New Brachiopod.* By A. Alcock, Superintendent of the Indian Museum.

PLATE VIII.

[Received and Read, 4th July.]

Of the *Brachiopoda* of Indian waters but little appears to be known. *Lingula* and *Crania* have been reported from the shallows, and a small species of *Terebratula* has—but not very commonly—been met with off Ceylon in 20–30 fathoms. I myself, in the course of four seasons systematic dredging, 1888–1892, on board the "Investigator," only once met with a Brachiopod — a minute species of *Terebratula*—dredged in 1891 in the Laccadive Sea, at 865–880 fathoms, on a bottom of Globigerina ooze. A certain amount of interest, therefore, attaches to any "finds" in these waters of representatives of this ancient class of animals.

The species described in the sequel is a *Terebratula* of remarkable size, dredged in the Laccadive-Maldive basin, off the island Uligamu of the Northern Maldive atoll, at a depth of 719 fathoms, on a bottom of fine coral sand. The species is represented, unfortunately, only by a dead shell, which however was quite perfect.

TEREBRATULA, Llhwyd.

Terebratula Johannis-Davisi, n. sp., Plate VIII.

Shell pyriform, inequilateral, thin but strong, its surface smooth except for the concentric lines of growth, and microscopically punctate: in colour purple-brown.

The shell is remarkable in being inequilateral, having a well-marked bulge to the left side (the shell being held ventral valve downwards and beak pointing backwards) and this asymmetry is shown by the lines of growth to have existed from an early period of life

The dorsal valve is slightly more convex than the ventral, and both valves have the margin simple, entire, and broadly turned over and bevelled all round.

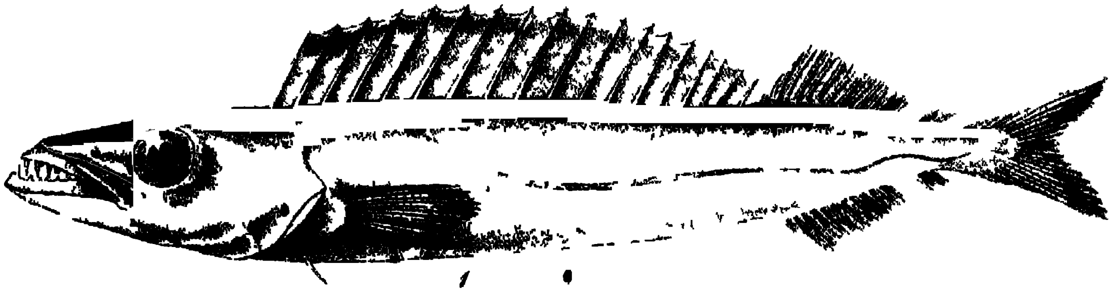
Internally, the dorsal valve has very prominent cardinal processes, and a small slender loop, the greatest convexity of which does not reach forward beyond the first fifth of the length of the shell.

The ventral valve has a re-curved beak which conceals the small deltidium, the latter consisting of a single piece transversely striated, and the beak being truncated by a thick-edged foramen

Greatest length of the shell 73 millim., greatest breadth 68 millim

I have named this species after the great Elizabethan navigator John Davis, who appears to have been the first English explorer to take an interest in the Maldive Islands

The plate explains itself.



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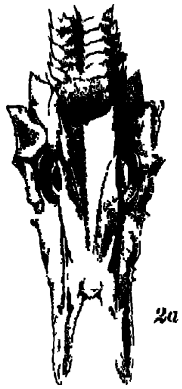

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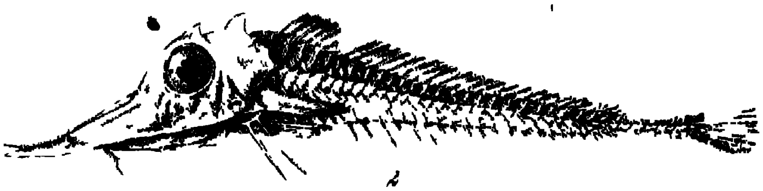

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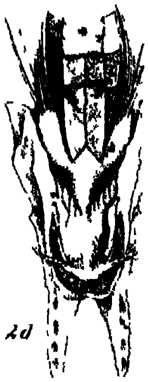

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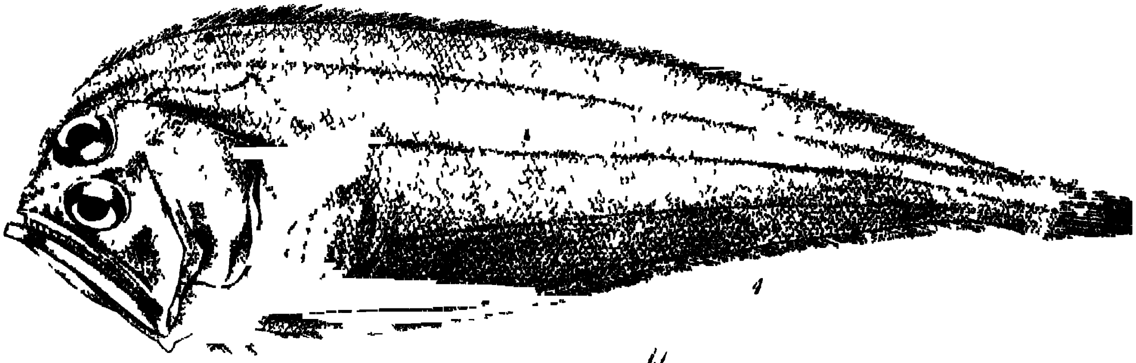

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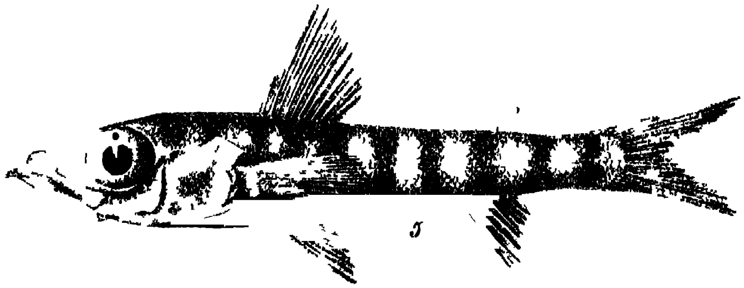

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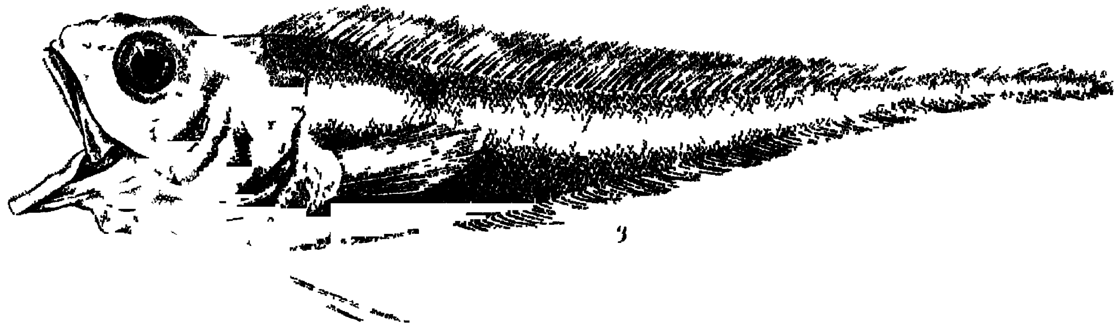

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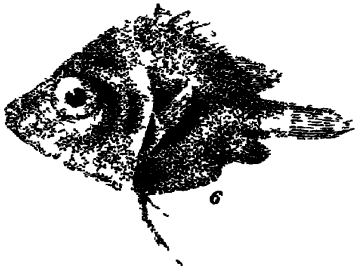
Alcock, J A S B Vol LXIII Pt II

PLATE VI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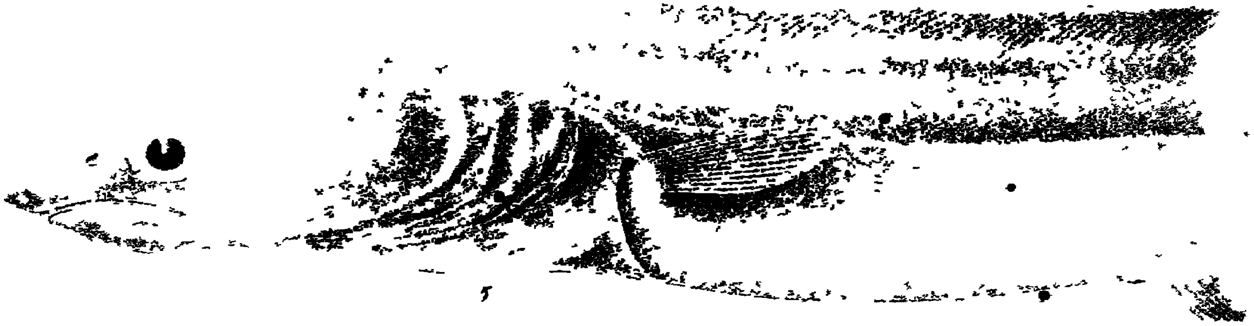
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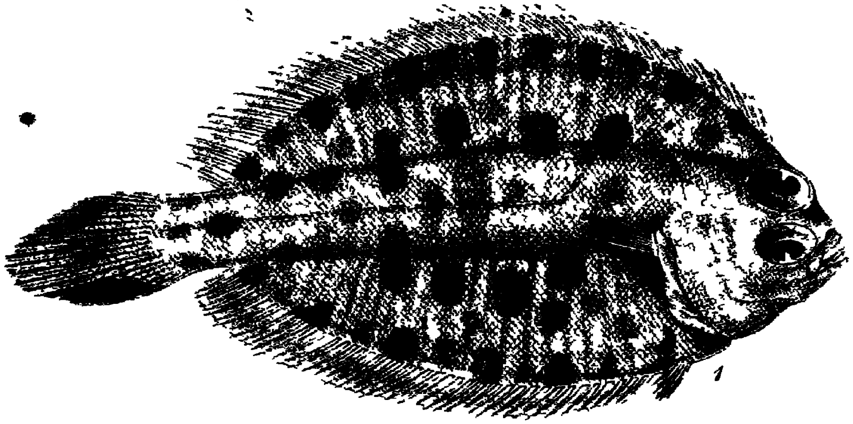
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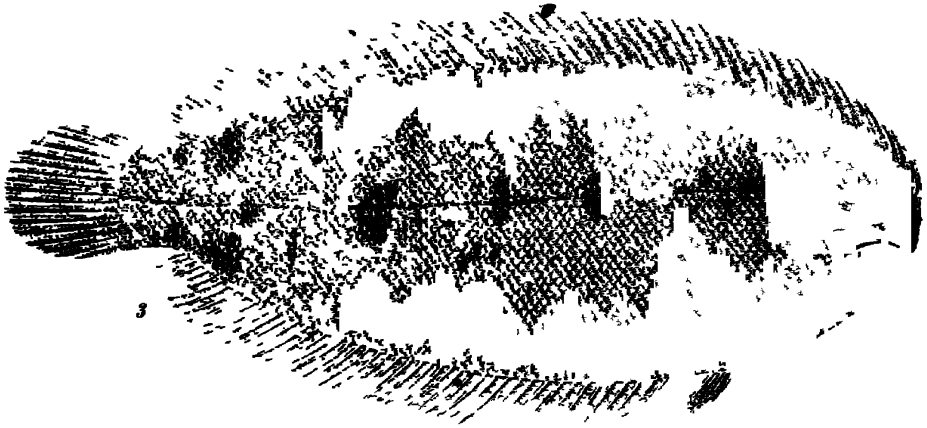
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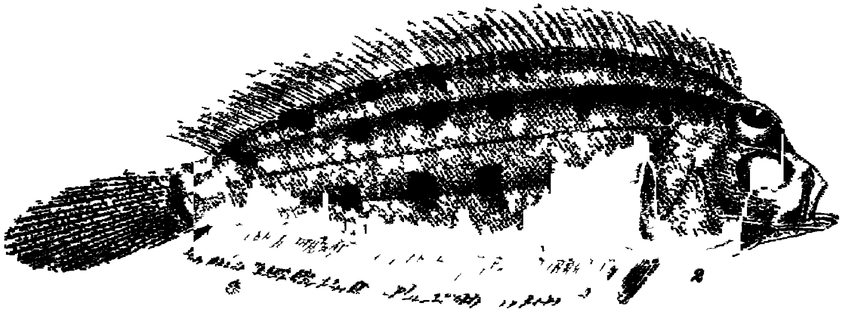
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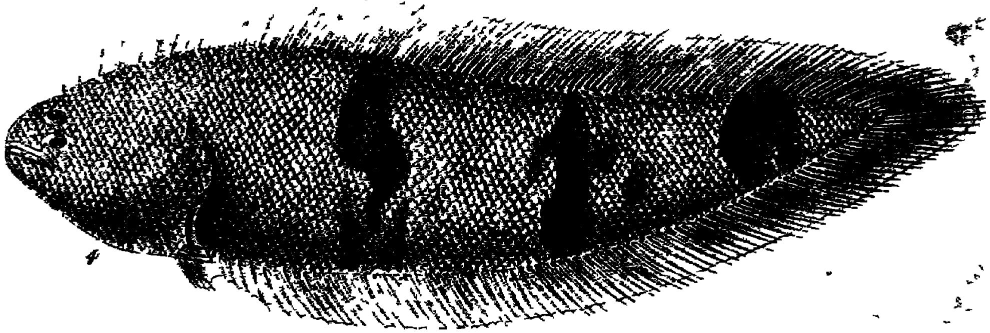
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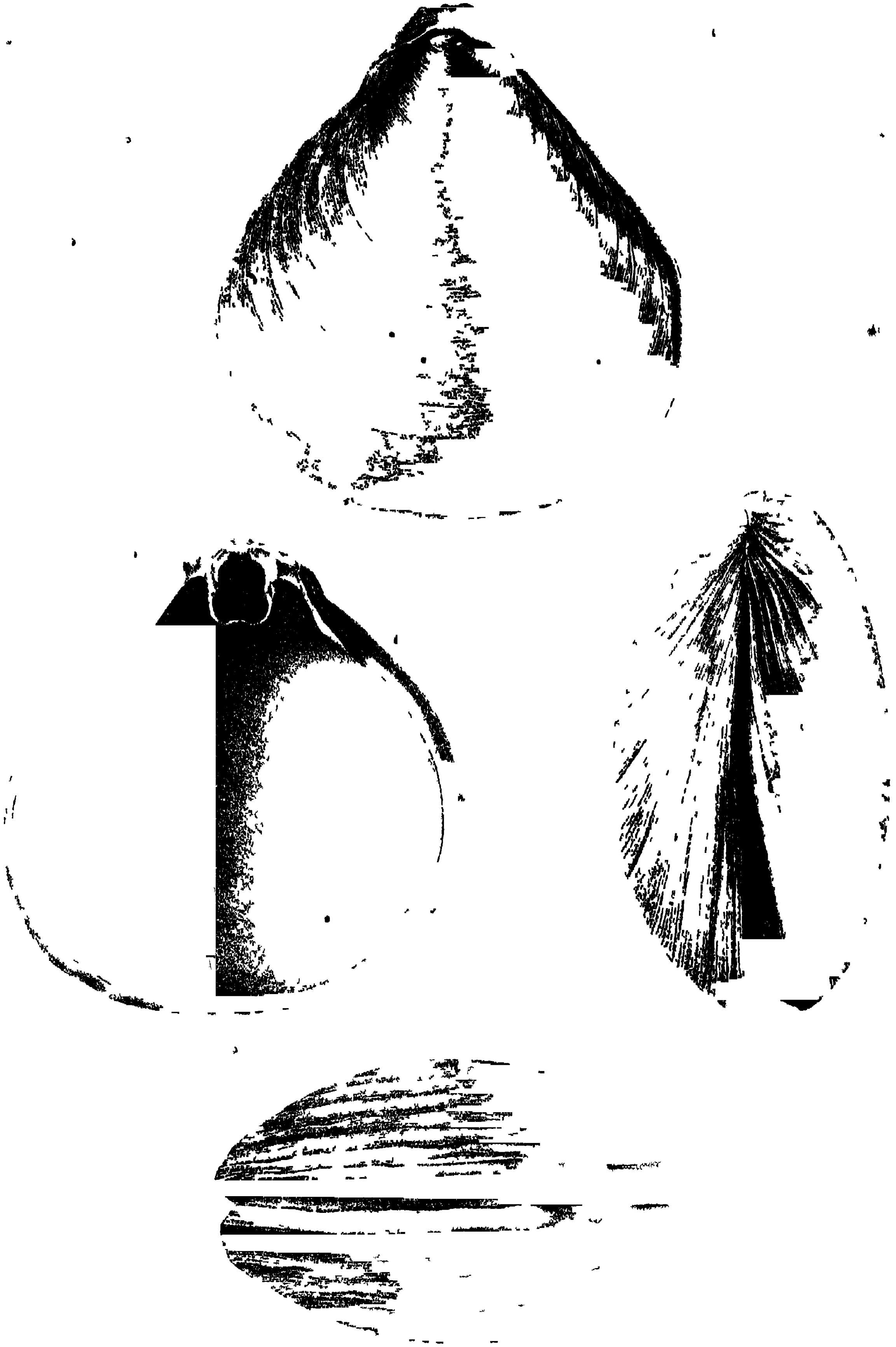
Alcock, J A S B Vol LXIII, Pt II PLATE VIII



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TEREBRATULA JOHANNIS-DAVISI

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Vol. LXIII. Part II.—NATURAL SCIENCE.

No III.—1894.

Natural History Notes from H M Indian Marine Survey Steamer 'Investigator,' Commander C F Oldham, R N, commanding Series II, No 14. *An Account of a Recent Collection of Deep Sea Crustacea from the Bay of Bengal and Laccadive Sea*—*By* A ALCOCK, M.B, C.M Z S, Superintendent of the Indian Museum, and A. R. ANDERSON, B.A., M.B, Surgeon-Naturalist to the Survey.

With plate IX

[Received 21st July—Read 1st August]

The collection described in the present paper numbers 96 species, exclusive of *Paguridea*, dredged in the Laccadive Sea and Bay of Bengal, in two seasons, 1891-92 and 1893-94, at depths ranging from 91 to 1,370 fathoms *

Of these 96 species, 31 appear to be undescribed, while 15 are new to the Indian fauna

Among what we regard as new forms, the most interesting are—(1) *Engystenopus*, a deep-sea Stenopid, differing from *Stenopus* chiefly in the simple unsegmented carpopodites and propodites, and the simple claw-like dactyli, of the 4th and 5th pairs of trunk-legs; (2) *Bathyankyristes*, a Galatheid, which differs from *Munidopsis* only in having the 2nd, 3rd, and 4th pairs of trunk-legs sub-cheliform, and (3) *Archaeoplax*, a Gonoplacid (?) crab of a remarkably antique facies, which appears to be closely connected also with *Cymopolia*.

Among the species new to the Indian Fauna, the following, which belong also to genera not before recorded from Indian waters, are worthy of mention —*Petalophthalmus, Benthesicymus, Eiconaxius, Calocaris, Uroptychus,* and *Ethusina* *Calocaris* is represented in our collection by the cosmopolitan *Calocaris macandreæ*, Bell We have figured our three new generic types (Plate IX) on account of their greater importance, but figures are being prepared of all our new species, and we hope that they will be published in next year's issue (Part III) of Illustrations of the Zoology of the *Investigator* Figures of the new species of *Glyphocrangon* and of *Pentacheles*, among which those referred to in the present paper (with one exception) will be found, are published in "Illustrations of the Zoology of the R I M S. *Investigator*, Part II," now in course of issue

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* A few species dredged in previous years have been included in special instances

List of the "Investigator" Dredging Stations referred to in the present paper

Station Number	Position	Depth in fathoms	Nature of Bottom	Bottom Temperature Fahr
116	Andaman Sea Lat 11° 25′ 5″ N, Long 92° 17′ 6″ E	405	Green mud	47°
121	Laccadive Sea Lat 11° 35′ 15″ N, Long 72° 2′ 37″ E	1,140	Coral mud	37 5°
122	Laccadive Sea, Lat 12° 5′ 35′ N, Long 71° 35′ 50″ E	865–880	Globigerina ooze	42°
124	Laccadive Sea, Lat 10° 47′ 45″ N, Long 72° 10′ 20″ E	705	Large debris of Reef Coral	?
125	Laccadive Sea, Lat 10° 7′ 50″ N, Long 74° 42′ 30″ E	1,250	Blue mud	36°
126	Laccadive Sea, Lat 8° 49′ 0″ N, Long 73° 18′ 45″ E	1,370	Coral mud	36°
127	Laccadive Sea, off the Island of Minnikoy	1,200	Globigerina and Coral ooze	?
128	Off Ceylon, Lat 6° 58′ N, Long 77° 26′ 50″ E	902	Green mud	?
129	Bay of Bengal, off Godavari Delta	270	Mud	51°
130	Bay of Bengal, off Godavari Delta	258–281	Mud	51°
131	Bay of Bengal, Lat 16° 01′ N, Long 81° 25′ E	410	Mud	45 5°
132	Bay of Bengal, Lat 12° 50′ N, Long 81° 30′ E	475	Mud	45 5°
135	Laccadive Sea, Lat 15° 29′ N, Long 72° 41′ E	559	Foraminifera in Green mud	47°
144	Laccadive Sea, Lat 15° 05′ 06″ N, Long 72° 48′ 10″ E	172	Sand	?
145	Laccadive Sea Lat 15° 05′ 03″ N, Long 72° 38′ 10″ E	696	Green mud	?
150	Off the Northern Maldive Atoll, Lat 7° 05′ 15″ N, Long 75° 04′ E	719	Fine Coral Sand	?
151	Off Colombo	142–400	Mud	?
159	Bay of Bengal, Lat 14° 05′ 55″ N, Long 80° 25′ 20″ E	112	Mud	?

Station Number	Position	Depth in fathoms	Nature of Bottom	Bottom Temperature; Fahr
162	Bay of Bengal, Lat 13° 51′ 12″ N, Long 80° 28′ 12″ E	145-250	Mud	?
163	Bay of Bengal, Lat 13° 45′ 38″ N, Long 80° 29′ 37″ E	210	Mud.	?
164	Bay of Bengal, Lat 13° 41′ 27″ N, Long 80° 32′ E	195-210	Mud	51 2°
166	Bay of Bengal, Lat 13° 34′ 55″ N, Long 80° 32′ 12″ E	133	Mud	54 8°
169	Bay, of Bengal, Lat 13° 05′ 27″ N, Long 80° 33′ 44″, E	91	Sand Shells, and Mud	?
170	Bay of Bengal, Lat 13° 01′ 06″ N, Long 80° 36′ 56″ E	107	Sand Cinders and Mud	?
172	Bay of Bengal, Off Trincomalee	200-350	Green Mud	53°-49 8°
173	Bay of Bengal, Off Trincomalee	609	Brown mud	44°
176	Laccadive Sea, Lat 11° 17′ 06″ N, Long 73° 57′ 30″ E	1070	Green Mud	37 5°
177	Laccadive Sea, Lat 13° 47′ 49″ N, Long 73° 07′ E	636	Green Mud	44 2°

MALACOSTRACA

Order SCHIZOPODA

Family **Lophogastridæ.**

GNATHOPHAUSIA, Suhm.

1 *Gnathophausia zoœa*, Suhm, G O Sars

G O Sars, 'Challenger' Schizopoda, p 44, pl vi, figs 6–10, and A Milne-Edwards, Rec Fig Crust pl. 7.

This species, which is new to the record of the Indian fauna, has been dredged in the Laccadive Sea at Station 128, 902 fms, and Station 150, 719 fms

It appears probable, from a comparison of the type of *Gnathophausia Sarsii*, Wood-Mason, which was founded on an injured specimen, with these perfectly preserved specimens, that the latter species should be included here.

THYSANOPODA, Edw, G O Sars.

2. *Thysanopoda obtusifrons*, G O Sars

G O Sars, 'Challenger' Schizopoda, p 102, pl xviii, figs 1-14

A large female was dredged in the Laccadive Sea, Station 125, 1,250 fms

The colour in life was smoky pink

This species is new to the Indian fauna.

Family **Mysidæ.**

PETALOPHTHALMUS, Willemoes-Suhm.

3 *Petalophthalmus armiger*, Willemoes-Suhm

Willemoes Suhm, Trans Linn. Soc (2) i 40, pl viii, and G O Sars, 'Challenger' Schizopoda, p 174, pl xxxii, figs 1–9

A male, 32 mm long, from the Laccadive Sea (Station 128), 902 fms., agrees exactly with the figures and descriptions of this remarkable species from the tropical Atlantic.

Order DECAPODA

Sub order MACRURA

Tribe *PENÆIDEA*

Family **Penæidæ.**

Sub-family *Parapenæina*

PARAPENÆUS, S I Smith

S I Smith, Rep U S Fish Comm for 1885, (1886), p [81]

4 *Parapenæus fissurus*, (Sp Bte)

Penæus fissurus, Sp Bte , 'Challenger' Macrura, p 263, pl xxxvi, fig 1

This species occurred (♂ and ♀) at Station 166, in the Bay of Bengal, 133 fathoms.

The branchial formula is —

Somite	Podobr	Arthrobr	Pleurobr	Total
viii	1	2	0	3
ix	0	2	1	3
x	0 (Ep.)	2	1	3+Ep
xi	0 (Ep)	2	1	3+Ep.
xii	0	2	1	3
xiii	0	1	1	2
xiv	0	0	0	0
	1	11	5	17+2 Ep.

METAPENÆUS, Wood Mason

Wood Mason, Ann Mag Nat Hist, October, 1891, p 271

5 *Metapenæus coniger*, Wood-Mason.

Wood-Mason, Ann Mag Nat Hist, October, 1891, p 272

This species occurred in almost every haul in the Bay of Bengal, between 100 and 250 fms.

6. *Metapenæus rectacutus*, (Sp Bte)

Penæus rectacutus, Sp Bte, 'Challenger' Macrura, p 266, pl xxxvi, fig 2, ♀ only

This species is as common as the preceding, in the Bay of Bengal, between 100 and 250 fms Our female specimens we have little hesitation in identifying with Spence Bate's descriptions and figures, which represent the female only, the male, apparently, not having been dredged by the 'Challenger,' but the males with which our females are constantly associated appear to agree in every detail, except in the form of the antennulary flagella, with Spence Bate's figures and description of *Penæus serratus* In all our males the outer antennulary flagellum is much longer than the inner, and is as much longer than the carapace as this is longer than the inner flagellum The inner flagellum, again, has its base curved to form a rigid semi-circular hoop, the convexity of which is vertically downwards, and the distal end of which, at the junction with the straight portion of the flagellum, is thickened and strongly re-curved

As Spence Bate does not mention the male of *Penæus rectacutus*, and as he records that the females, for which he establishes the species, were also found associated, as in our case, with *Penæus serratus*, from which he separated them only on account of certain differences in the "thelycum," it is not unreasonable to suspect, in the light of our further extended observations, that *Penæus* (*Metapenæus*) *serratus* and *rectacutus* may be male and female of a single species

Sub-family *Solenocerinа*

SOLENOCERA, Lucas

7 *Solenocera hextii*, Wood-Mason

Wood Mason, Ann Mag Nat Hist, Feb 1891, p 188, and Oct 1891, p 275

This species is characteristic of the Bay of Bengal, at and near 100 fms

Solenocera agassizii, Faxon, Bull Mus Comp Zool Vol XXIV, No 7, 1893, p 211, would appear to be extremely near to, if not identical with, this species

In the largest specimens of *S hextii* the sub-equal antennulary flagella are from half to three-fifths the length of the carapace, measured in the mid-dorsal line without the rostrum, and there are 7 or 8 teeth on the rostrum and carina This species is being figured for next year's issue of the 'Illustrations' of the 'Investigator.'

HALIPORUS, Spence Bate

8 *Haliporus æqualis*, Sp. Bate.

Spence Bate, 'Challenger' Macrura, p 285, pl xli, fig 1.

Specimens were again obtained in the Bay of Bengal, at Station 164, 195–210 fms

9 *Haliporus villosus*, n sp

Agrees in almost every particular with *Haliporus curvirostris*, Sp. Bte ('Challenger' Macrura, p 288, pl xlii, fig 1), but has not only the carapace but also the abdominal terga and pleuræ densely covered with fine flexible spinules and setæ The entire integument is membranous or coriaceous The rostrum is also longer, and although strongly arched, has the tip porrect in its entire extent—posterior carina included—there are only 6–8 spines

The branchial formula is —

Somite	Podobr.	Arthrobr	Pleurobr	Total
viii	1	2	0	3
ix	0 (Ep)	2	1	3+Ep
x	0 (Ep)	2	1	3+Ep.
xi	0 (Ep)	2	1	3+Ep
xii	0 (Ep)	2	1	3+Ep
xiii	0 (Ep)	2	1	3+Ep
xiv	0 (Ep)	0	1	1+Ep.
	1	12	6	19+6 Ep

From the Laccadive Sea, Stations 121 and 127, 1,140 fms. and 1,200 fms, respectively

10 *Haliporus microps*, (S I Smith)

Hymenopenæus microps, S I Smith, Rep U S Fish Comm, 1884, p 413, pl x, fig 1, and 1886, p [84], pl xvi, fig 8, and Wood-Mason, Ann Mag. Nat. Hist, Feb 1891, p 188, and Oct 1891, p 277

From the Laccadive Sea, Stations 122 and 176, 880 fms. and 1,070 fms, respectively.

Sub-family *Aristæina.*

ARISTÆUS, Duvernoy, Wood-Mason

11 *Aristæus semidentatus*, (Sp Bate).

Hemipenæus semidentatus, Sp Bate, 'Challenger' Macrura, p 305, pl xlix, fig 1

Aristæus semidentatus, Wood-Mason, Ann Mag Nat. Hist, Oct. 1891, p 280

This species is common in the Bay of Bengal, between 150 and 300 fms.

12. *Aristæus crassipes*, Wood-Mason

Wood-Mason, Ann Mag Nat Hist, Oct 1891, pp 281, 282, fig 7

As in *Aristæus virilis* (Sp Bte), and *Aristæus semidentatus* (Sp Bte), so also in this species, the rostrum in the female is, in proportion, much longer than it is in the male, except in young specimens. Another remarkable sexual difference, besides the much greater size of the female, and one that is found in all three species, is to be seen in the condition of the external maxillipeds These appendages in the male are remarkably robust, the three terminal segments especially being greatly thickened and broadened the antero-external angle of the propodite is prolonged to form a coarse spine which is surmounted by a brush of hairs, while the dactylopodite is truncated or actually inflated at tip and doubly curved, (forming a singular crook in *Aristæus crassipes*) In the female the maxillipeds are of the ordinary slender form, except that their styliform dactylopodite has its base expanded and notched, suggesting the idea that it forms with the crooked dactylus of the male a prehensile apparatus In all of the three species mentioned, namely *Aristæus virilis*, *A semidentatus*, and *A crassipes*, the endopodite of the second pleopods is trifid or tripartite, consisting, from before backwards, of—(1) a broad scoop-like plate, (2) a tooth-like blade that closes upon the scoop, and (3) a multiarticulate flagellum

ARISTÆOPSIS, Wood-Mason

13 *Aristæopsis edwardsiana* (Johnson)

Wood Mason, Ann Mag Nat Hist, Oct 1891, pp 283-284 fig 8, (see synonomy), and Ill Zool H. M I M S Investigator, Crustacea, pl i.

This species occurred in the Bay of Bengal, Station 132, 475 fms, and in the Laccadive Sea, Station 121, 705 fms

HEMIPENÆUS, Spence Bate

14 *Hemipenæus carpenteri*, Wood-Mason

Wood-Mason, Ann Mag Nat Hist, Feb 1891, p 189, and Oct 1891, p 286

A young male from the Laccadive Sea, Station 127 1,200 fms.

Sub-family *Benthesicymina*

BENTHESICYMUS, Spence Bate.

15 *Benthesicymus carinatus*, S I. Smith.

S I. Smith, Rep U S Fish Comm for 1882 (1884), p 396

A single specimen, apparently identical with the above species, was dredged in the Laccadive Sea at Station 128, 902 fms It is new to the Indian fauna

Family **Sergestidæ.**

SERGESTES, Edw

16 *Sergestes bisulcatus*, Wood-Mason

Wood Mason, Ann Mag Nat Hist, Nov 1891, p 353

Bay of Bengal, Station 132, 475 fms

17 *Sergestes robustus*, Smith.

S I Smith, Rep U S Fish Comm, 1882, (1884), p 416, pl viii, figs 3-6, and 1885, (1886), p [93], pl xx, fig 6, and Bull Mus Comp Zool, x, p 97 pl xvi, figs 5-8.

Colour in life, crimson.

Laccadive Sea and Bay of Bengal Stations 128, 172, and 177, 902 fms, 200-350 fms, and 636 fms, respectively

New to the Indian fauna

18 *Sergestes hamifer*, n sp

In many respects showing a resemblance to *S diapontius*, Sp Bte. 'Challenger' Macrura, p 399, pl lxxii, fig 3, and to *S penerinkii*, id *ibid*, p 418, pl lxxvi, fig 3

The extreme length of the membranous carapace is about equal to the combined length of the first five abdominal somites. The rostrum is about half the length of the eye-stalks, and ends in a sharp point The eye-stalks are about two-thirds the length of the first joint of the antennulary peduncles, and the eyes are not expanded.

The antennulary peduncles, which are over two-thirds the length of the carapace, have the two basal joints stout, and the third joint, which is the longest, slender and tapering the outer flagellum is longer than the animal, the inner is not as long as the eye-stalk The acute point of the antennary scale reaches nearly to the end of the antennulary peduncle The 2nd maxillipeds are stout but short, being not longer than the combined ischium and merus of the next pair the three terminal joints are permanently flexed in relation to the merus.

The external maxillipeds far exceed all the other appendages in length and stoutness, and exceed the total length of the animal their ischium and merus are singularly coarse, and are horizontally compressed their carpus and two succeeding joints, on the other hand, are slender, and form a delicate flagellum, which is permanently flexed in relation to the truncated merus their propus is four jointed, and is armed on its flexor surface, as is the distal end of the carpus, with long recurved acicular spines similar in size and form to the dactylus

The thoracic legs are all short and slender the 2nd and 3rd pairs, which are the longest, are only about half the length of the external maxillipeds, and are distinctly chelate the 4th pair have the three terminal joints remarkably compressed and lamellar the 5th pair are about half the length of the carapace

The abdominal terga are all faintly grooved along the middle line The setose telson is hardly two-thirds the length of the acute internal uropod the external uropod is quite unarmed

From the Laccadive Sea, Station 126, 1,370 fathoms

Tribe *STENOPIDEA*

Family **Stenopidæ**

ENGYSTENOPUS, n gen

As *Stenopus*, but with simple claw-like dactyli to the fourth and fifth pairs of trunk legs, which also have all their joints simple and unsegmented, and with the third pair of trunk legs remarkably slender as far as the propodus The external maxillipeds are of the ordinary pediform shape

19 *Engystenopus palmipes*, n sp., Plate IX, fig 1

Entire surface, except for a few definitely situated spines, chiefly on certain of the appendages, perfectly smooth and polished

The carapace, measured in the middle line without the rostrum, is about half the length of the abdomen its frontal border on either side of the rostrum is, like the posterior border, strongly emarginate, and is armed at each antero-lateral angle with a pair of small spinelets its regions, with the exception of the gastric, are ill defined The rostrum, which reaches to about the middle of the second joint of the antennulary peduncle, has a slight double curve its concave upper border bears numerous very close sharp equal serrations, and its convex lower border has a single spine large enough to make the rostrum, when viewed from the side, appear bifid on the front part of the well-defined gastric region, on either side of the base of the rostrum, is a procumbent acicular spine Of the abdominal terga the third is of predominant size The angular abdominal pleuræ have the edge distantly and unevenly spinulate The telson is similar in shape and sub-equal in size to the lobes of the swimmeret The eye-stalks are very short—about half the length of the free portion of the rostrum the corneæ are small, opaque, and deficient in pigment

The antennulary peduncles are between one-third and one-half the length of the carapace the sub-equal antennulary flagella are more than half as long again as the entire animal The basal joint of the antennæ is spiny at the antero-external angle, as is also the outer border of the antennal scale, this last being more than half the length of the carapace and being fringed with setæ of great length along its inner border The mandibular palps are not apparent in the undissected specimen The external maxillipeds are pediform, and are hairy along the inner edge their segments are all simple and undivided, and their tips reach to the end of the antennal scale.

The trunk legs are bilaterally symmetrical the first three pairs are chelate and have the carpus long, the first two pairs being very slender, and the third pair also being slender as far as the chelæ, which are enormously expanded Those of the first pair are not much longer than the external maxillipeds, those of the second pair exceed by about one-third of their length those of the first, while those of the third pair are longer by the extent of the dactylus than the entire animal In this pair the basis ischium and carpus are long and slender, and the two last-named joints have both the inner and the outer border distantly and sharply spinate, the carpus becoming suddenly inflated at its distal end for the support of the huge chelæ these chelæ are symmetrical, but are not quite similar in every detail, the fingers of the one being more closely apposable than those of the other To describe these chelæ more in detail—they form a good deal more than one-third of the entire extent of the third pair of legs, and their greatest breadth, across the palm, is rather more than the greatest breadth of the abdomen the palms are compressed, with the edges almost carinate and distally finely spinate the fingers, which are considerably longer than the palm and are also thin and compressed, have their outside edges serrated in the proximal half, and the apposed edges smooth, except for one or two coarse teeth, or tubercles, at the base in one pair a large tubercle on the propus fits in between two large tubercles on the opposite finger, while in the other pair—the pair in which the fingers can be completely apposed—there is but one small tubercle on each finger The fourth and fifth pairs of trunk legs are slender, are about equal in length to the third pair *minus* the chelæ, and end each in a simple claw-like dactylus in both pairs all the joints consist of single non segmented pieces

The abdominal appendages exhibit nothing unusual The caudal swimmeret is somewhat of the Astacidean type, the blades being sub-equal, and being very similar in size and shape to the telson the outer edge of the exopodite is strongly and sharply serrated

A single female, about 31 millim long from tip of rostrum to tip of telson, from the Bay of Bengal, off Trincomallee, Station 172, 200-350 fms

The colours in life were body salmon-red, flecked slightly with white, third pair of trunk legs with white nodes and salmon-pink internodes

Tribe *CARIDEA*

Family **Glyphocrangonidæ.**

GLYPHOCRANGON, A Milne-Edwards

20 *Glyphocrangon investigatoris*, Wood-Mason

Wood Mason, Ann Mag Nat Hist, Feb 1891, p 191, and Illustrations Zool R I M S 'Investigator,' pl vi, fig 3

This species is of frequent occurrence in the Bay of Bengal, being taken this year at Stations 130, 131, and 162, 281 fms, 410 fms and 145–250 fms, respectively.

21 *Glyphocrangon investigatoris*, var *andamanensis*, Wood-Mason

Wood Mason, Ann Mag Nat Hist, Nov 1891, p 356, and Ill Zool R I M S 'Investigator,' pl vi, fig 2

Dredged this year in the Gulf of Manaar, Station 151, 142–400 fms.

22 *Glyphocrangon priononota*, Wood-Mason

Wood Mason, Ann Mag Nat Hist, Feb 1891, p 192, and Ill Zool R I M S 'Investigator,' pl vi, fig 1

Taken in the Laccadive Sea, Station 122, 865–880 fms

23 *Glyphocrangon hastacauda*, Sp Bte

Spence Bate, 'Challenger' Macrura, p 519, pl xciii, fig 5

From the Bay of Bengal, Station 173, 609 fms
Colour in life, pale salmon-red.
New to the Indian fauna

24 *Glyphocrangon cerea*, n sp

Belonging to the late Professor Wood-Mason's 3rd section of the genus, where it is very close to *Glyphocrangon cæca*, but departing even more widely than that species from the typical form, especially in regard to the eyes, which are quite degenerate

The entire surface of the trunk and tail is smooth The characteristic carapacial crests are reduced to rows of insignificant tubercles, with the exception of the lateral crests which, though faint, are entire The compressed spine at the antero-external angles of the carapace, or, to adopt Professor Wood-Mason's terminology, the spine of the anterior moiety of the fourth or lateral crest on each side, is of huge size, and is remarkably oblique from its base a small spine at the front limit of the branchiostegal region projects obliquely downwards and inwards The external orbital or antennal spine is remarkably small and inconspicuous The rostrum projects considerably beyond the end of the antennulary peduncle it has the usual two pairs of marginal spines which, however, are very small, the posterior pair especially being little more than tubercles

The abdominal terga have the sculpturing almost obsolete the first has its front edge rugose, the second and third are quite smooth, the fourth in its posterior half, and the fifth and sixth throughout, are faintly carinated, the two latter also having some almost obliterated sculpturing The abdominal pleuræ have the free edge bluntly spinate, and the surface hardly perceptibly rugose

The eye-stalks are short, even for the genus, and the corneæ, which are quite devoid of pigment, are but one-fifth the length of the free portion of the rostrum in diameter

The antennal scales stand out remarkably free from the carapace throughout, and are sub-circular in form

The other appendages present nothing remarkable, except those that form the swimmeret—these being very slender, and being much shorter than the telson

Laccadive Sea, Station 150, 719 fms

Family **Crangonidæ.**

CRANGON, Fabr

25 *Crangon bengalensis*, Wood-Mason

Wood Mason, Ann Mag Nat Hist, Nov 1891, p 360

Bay of Bengal, Stations 162 and 170, 145 to 250 fms, and 107 fms respectively

PRIONOCRANGON, Wood-Mason

26 *Prionocrangon ommatosteres*, Wood-Mason

Wood Mason, Ann Mag Nat Hist, Nov 1891, p 362

An ovigerous female, about 30 mm long, from the Bay of Bengal, Station 172, 200 to 350 fms, differs from the single known male taken in the Andaman Sea (Station 116, 405 fms) in the following particulars —the serrated gastric crest is six-toothed, the carapace is less than one-third the total length, the abdomen is vastly broader. The eggs are remarkably large

In the original description, the 3rd and 4th pairs of legs are by mistake, for the 4th and 5th, stated to be more robust than the second the 3rd pair of legs are, as stated at the outset, of the usual Crangonine form, and are remarkably filiform

This curious blind Crangonid will be figured in the issue of the "Illustrations of the Zoology of the R I M S 'Investigator,'" now in preparation

Family **Psalidopodidæ**

PSALIDOPUS, Wood-Mason

27 *Psalidopus spiniventris*, Wood-Mason

Wood Mason, Ann Mag Nat Hist, April 1892, p 274, pl xiv, figs 3-6a, 8, pl xv, figs 1-10

A fine male of this remarkable species was taken at Station 177 in the Laccadive Sea, 636 fms

Family **Alpheidæ**

ALPHEUS, Fabr

28 *Alpheus macroskeles*, n sp

Distinguished from all other species by the form of the great chelipeds, which are of singular tenuity, equally in all their segments, the larger cheliped having a long sub-cylindrical tapering hand, and exceedingly short fingers.

The integument, though firmly chitinized, is very thin The eyes are markedly deficient in pigment The thickened outer flagellum of the antennules has the usual abruptly filiform ending, up to and around which it is thickly fringed with setæ of remarkable length and silkiness

The chelipeds are remarkable for their great length—in the largest specimen they are considerably longer than the body—for their comparative tenuity, for their straightness, and for their smoothness—their setæ being so few and so fine as to be invisible to the naked eye The hands only are asymmetrical in the larger hand, which may be right or left, the fingers are only a third the length of the sub-cylindrical tapering palm, and half the length of the meropodite, and the palm is from one-third to more than one-half the length of the animal in the smaller hand the fingers are equal in length to the palm, which is not one-sixth the length of the animal, and are two-thirds the length of the meropodite In the larger hand also the fingers are compressed, the dactylus is carinated, and carries a small tooth that fits into a foramen in the apposed finger in the smaller hand the fingers are slender, sub-cylindrical, and elegantly curved. The second pair of pereiopods are also remarkable for their length and slenderness they are of the typical form, having a long 5-articulate carpus

Colours in spirit, ivory white in life, transparent blood red

From the Bay of Bengal, Station 129 (off Godávari) 270 fms, and Station 162 (off Pulicat), 145–250 fms This remarkable species also appears in the collections of previous years from the "Swatch" 193 fms, and from the Andaman Sea, 193 fms

Family **Pandalidæ**

PANDALUS, Leach.

29 *Pandalus martius*, A Milne-Edwards

A Milne-Edwards Rec Fig Crust, and Wood-Mason and Alcock, Ann. Mag Nat Hist, May 1892, p 369

Several specimens that we identify with this species, from Station 151, off Colombo, 142 to 400 fms

30 *Pandalus*, sp

With the above was dredged a single mutilated specimen which so far as identification is possible, is somewhat like *Pandalus stylopus*, A M-E, Rec Fig Crust

HETEROCARPUS, A Milne-Edwards

31 *Heterocarpus alphonsi*, Sp Bte

Spence Bate, 'Challenger' Macrura, p 632, pl cxii, fig 1, and Wood Mason Ann Mag Nat Hist, Feb, 1891, p 196, and May 1892, p 367

Laccadive Sea, Station 177, 636 fms

32. *Heterocarpus gibbosus*, Sp Bte

Spence Bate, 'Challenger' Macrura, p 634, pl cxii, fig 2, and Wood-Mason and Alcock, Ann Mag Nat Hist, May 1892, pp 368 and 369, fig 6

Bay of Bengal, Station 162, 145 to 250 fms

33 *Heterocarpus tricarinatus*, n sp

Near *H gibbosus*, from which it is readily distinguished by its smaller size, and by the indistinctness of the lower lateral carina, which fades completely before reaching the posterior half of the carapace.

The median dorsal carina is only less prominent than that of *H gibbosus* it bears behind the limit of the orbit five or six teeth, while on the up-curved rostrum—which is more than five-sixths the length of the carapace measured in the mid-dorsal line—are six or seven dorsal teeth, and seven (male) to ten (female) ventral teeth.

The upper lateral carina is prominent, and is curved just as in *H gibbosus*, and is not confluent with the strong antennal spine. The lower lateral carina, which is continuous with the very prominent branchiostegal spine, ends in the anterior half of the carapace

The abdominal terga, as in *H gibbosus*, *H alexandri*, *H lævis*, and *H. lævigatus*, are all non-carinate and non-spinate the depressed telson, which is equal in length to the uropods, has four pairs of marginal, and several larger terminal, spines

The appendages quite resemble those of *H gibbosus*, except that the sub-equal antennulary flagella are more than three-fourths the length of the body, rostrum included

The branchial formula is identical with that of *H gibbosus* and *H alphonsi*, and is as follows —

Somites and their appendages	Podo branchiæ	Arthrobranchiæ	Pleuro-branchiæ	Total
viii	1	r	0	$1+r$
ix	0 (Ep)	1	1	2+Ep
x	0 (Ep)	1	1	2+Ep
xi	0 (Ep)	1	1	2+Ep
xii	0 (Ep)	1	1	2+Ep
xiii	0 (Ep)	1	1	2+Ep
xiv	0	0	1	1
	1+5 Ep	5	6	12+5 Ep $+r$

A male and two ovigerous females from the Laccadive Sea, Station 122, 880 fms

Colour in life, pink

PLESIONIKA, Spence Bate

34 *? Plesionika bifurca*, n. sp.

Carapace smooth, dorsally carinated in rather more than its outer half, the carina having four teeth behind the limit of the orbit, while the up-curved rostrum, which is about two-thirds the length of the carapace measured in the mid-dorsal line, has three or four dorsal and five ventral teeth all these teeth are large and distant There is a strong antennal spine, but the branchiostegal spine is almost obsolete.

The pleon is little compressed, and the abdominal terga are smooth and are not produced posteriorly, except the sixth, which forms a short blunt tooth on either side of the telson The depressed telson, which is almost as long as the uropods, has four pairs of lateral, and several terminal spinelets, the outermost of the terminal spinelets on each side being of remarkable length and strength.

The eyes are large and reniform The other appendages resemble those of *Heterocarpus gibbosus* The branchial formula is identical with that of the three species of *Heterocarpus* in our collection, the pleurobranch of the IX th somite, which according to Spence Bate ('Challenger' Macrura, p 653) distinguishes *Plesionika* from *Heterocarpus*, being certainly present in all the species identified by the late Professor Wood-Mason and ourselves as *Heterocarpus* Two ovigerous females, from the Laccadive Sea, Station 177, 636 fms

Colour in life, red

Family **Acanthephyridæ**

ACANTHEPHYRA, A Milne-Edwards

35 *Acanthephyra armata*, A M-E, var *fimbriata*, W-M.

Wood-Mason, Ann Mag Nat Hist, May, 1892, p 359, fig 2, and Ill Zool 'Investigator,' Crustacea, pl iii, fig 1

Two magnificent males, both over 7 inches long, from the Bay of Bengal, Station 132, 475 fms, and a smaller one, 5 inches long, from Station 135, off the Malabar Coast, 559 fms

In all our specimens there are only four dorsal spines at the base of the rostrum, and the single ventral spine arises midway between the base and the apex of the rostrum, and the legs are most remarkably setose

36 *Acanthephyra sanguinea*, Wood-Mason

Wood-Mason, Ann Mag Nat Hist, May 1892, p 358, fig 1

Laccadive Sea, Stations 122 and 128, 880 and 902 fms, respectively

37 *Acanthephyra brachytelsonis*, Sp Bte.

Spence Bate, 'Challenger' Macrura, p 753, pl cxxvi, fig 7, Wood Mason, Ann Mag. Nat Hist, May 1892, pp 362, 363, fig. 4, and Ill Zool. 'Investigator,' Crustacea, pl iii, fig 2.

This species is common in the Laccadive Sea, from 753 to 902 fms.

HOPLOPHORUS, Edw

38 *Hoplophorus gracilirostris*, A M-Edw.

A Milne-Edwards, Ann Sci Nat Zool, 1881, (6) xi 4 p 6, and Rec Fig Crust., and Wood-Mason, Ann Mag Nat Hist, May 1892, p 365 (see synon)

This species is fairly common in the Bay of Bengal, from 145 to 609 fms As previously mentioned, it would appear to live at no great distance below the surface

Family **Palæmonidæ.**

PALÆMONELLA, Dana

39 *Palæmonella laccadivensis*, n sp.

Distinguished by the remarkable shortness of the carpus of the second pair of chelipeds, which is shorter even than in Spence Bate's doubtful genus *Brachycarpus*

The up-curved rostrum, which projects just beyond the tip of the antennulary peduncles, and nearly reaches the tip of the antennal scale, has ten dorsal teeth—two or three of which are on the gastric region—and two ventral teeth near the middle of its free portion The antennal spine, though very distinct, is not nearly so large as the hepatic

At the tip of the telson are six spines, three on either side of the middle line, the middle one of each triad being much the longest

The spine on the basal joint of the peduncles of the triflagellate antennules is very distinct, as is also that on the basal joint of the antennary peduncles, and that at the tip of the antennal scale

The pediform external maxillipeds are exceedingly slender. The first pair of legs are the shortest and most slender of the five, and end in slender chelæ the second pair are the longest and stoutest, but are quite slender as far as the carpus, the hands alone being moderately inflated, with cylindrical palms These hands are not symmetrical, that on one side having its palm twice as stout and one-third again as long as its fellow, or as long as the carapace, or one-third the total length of the body the carpus is extremely short, on neither side being as much as one-fourth as long as the palm of the larger hand.

An egg-laden female, 23 millim. long, was dredged in the Laccadive Sea, Station 124, 705 fms.

Colour in life, pink.

Family **Pasiphæidæ**

PASIPHÆA, Savigny, Edw.

40 *Pasiphæa sivado*, (Risso).

For synonomy, etc, see Wood Mason, Ann Mag Nat Hist, Feb 1893, p 161.

Bay of Bengal, Station 172, 200 to 350 fms.

41 *Pasiphæa unispinosa*, Wood-Mason.

Wood-Mason, Ann Mag Nat. Hist, Feb 1893, p 163, and Ill Zool. 'Investigator,' Crustacea, pl iii, fig 7

Bay of Bengal, Station 172, 200 to 350 fms

PARAPASIPHÆA, S I Smith

42 *Parapasiphæa* (*Eupasiphæa*) *latirostris*, Wood-Mason

Wood-Mason, Ann Mag Nat Hist, Feb 1891, p 196, and Feb 1893, p. 166, fig 2

A second example of this fine species was dredged in the Laccadive Sea, Station 145, 696 fms.

43 *Parapasiphæa* (*Eupasiphæa*) *gilesii*, Wood-Mason.

Wood Mason, Ann Mag Nat Hist, Feb 1893, p 166, and Ill Zool. 'Investigator,' Crustacea, pl iii, fig 8

Bay of Bengal, Station 145, 696 fms

PSATHYROCARIS, Wood-Mason

44 *Psathyrocaris fragilis*, Wood-Mason

Wood Mason, Ann Mag Nat Hist, Feb 1893, p 171, pl X, XI

Laccadive Sea, Station 114, 172 fms, and Bay of Bengal, Station 173, 609 fms

45 *Psathyrocaris platyophthalmus*, n sp

Differs from *Psathyrocaris fragilis* only in the following particulars, so far as can be judged from a single specimen destitute of the second and fourth pairs of legs —

(1) The eye-stalks, instead of being moderately depressed and not much broader than deep, are extremely depressed, being twice as broad as deep, (2) the corneæ, instead of being indistinctly reniform and broadly visible from above, are markedly reniform and only visible from above as a thin crescent, (3) the exopodites of the pleopods, instead of being about twenty times as long as the endopodites, are not ten times as long

Colours in life, crimson lake

The single specimen measures 93 mm from tip of rostrum to tip of telson, and carries six eggs (also crimson lake in the fresh state) any one of which has a major diameter, even after contraction in spirit, of 6mm

Laccadive Sea, Station 124, 705 fms.

46 *Psathyrocaris plumosa*, n sp

Differs from *Psathyrocaris fragilis* only in the following particulars —

(1) The entire integument is covered with a fine very short down, instead of being quite smooth, and the appendages in general, instead of being sparsely and very finely setaceous, are thickly and coarsely setaceous, (2) the rostrum is longer, projecting beyond the eyes, instead of being shorter than the eye-stalks, but is otherwise dorsally serrated and ventrally ciliated, as in the other species, (3) the eyes are less pigmented, (4) the antennulary peduncles, instead of being almost devoid of setæ, are thickly setose—the "stylocerite," especially, (5) the antennary scale is larger, and its inner edge is coarsely, instead of finely, setose, (6) the external maxillipeds, instead of being finely and sparsely setose, are thickly fringed with very coarse setæ, and their dactylopodite, instead of being narrowly lanceolate and nearly bare, has the form of a broadly lanceolate brush, (7) the large chela of the second pair of legs, instead of being plainly shorter than the palm, is as long as the palm, and instead of having setiform teeth that are hardly visible to the naked eye, has plainly visible acicular teeth—those of the larger series being particularly strong, (8) the exopodites of the abdominal appendages, instead of having setæ of microscopic tenuity, have the setæ very coarse

Laccadive Sea, Station 128, 902 fms.

47 *Psathyrocaris infirma*, Wood-Mason MS (name only)

The integument is quite smooth, and the appendages have fine silky setæ, as in *P. fragilis* and *P platyophthalmus*, and, as in *P platyophthalmus*, the endopodites of the abdominal appendages are large relatively to the exopodites but the present species is distinguished from all its congeners by the form of the rostrum and of the carpopodites of the first two pairs of trunk legs

The rostrum, instead of being flush with the carapace, is strongly humped or arched it is finely serrated dorsally, and setose ventrally, as in all the other species, and does not equal the eyes in length The pediform external maxillipeds have narrowly lanceolate and finely setose dactyli, as in *P fragilis* and *P platyophthalmus*

The two first pairs of trunk-legs in general form resemble those of the other species, but in both pairs the carpopodite is ovoid and receives the meral articulation at its middle, like the handle of a crutch on the dorsal aspect of the merus, just behind this articulation, is either an eminence or a large spine The larger cheliped of the second pair of legs also differs from that of other species with which comparison is possible in the following points —(1) it is relatively shorter, being only about half the length of the animal, instead of being nearly or quite as long as the animal, (2) its meropodite has its lower edge closely and regularly spinate, instead of being quite smooth, (3) its chela, instead of being at least three-quarters the length of the palm, is only half the length of the palm, and (4) its setiform teeth, instead of being in two regular series of different sizes, are all of one size

As already stated, the endopodites of the abdominal appendages (1st to 5th) are large, being from one-fourth to one sixth the length of the exopodites

Colour in life, crimson.

Andaman Sea, Station 116, 405 fms.

Key to the species of PSATHYROCARIS

I * Rostrum straight carpopodites of both pairs of chelipods of the ordinary form, and articulating with the meropodites in the ordinary manner —
  1. ** Eye-stalks moderately depressed eyes indistinctly reniform exopodites of abdominal appendages about twenty times as long as the endopodites —
    a † Integument perfectly smooth appendages with sparse silky setæ . *P fragilis.*
    b. † Integument closely and finely pubescent appendages thickly and coarsely setaceous ... . *P. plumosa.*
  2 ** Eye-stalks laminar eyes markedly reniform exopodites of abdominal appendages not ten times as long as the endopodites . . . *P platyophthalmus*
II * Rostrum dorsally arched carpopodites of both pairs of chelipeds ovoid and forming a movable crutch-handle articulation with the meropodites ... *P infirma*

Family **Nematocarcinidæ**

NEMATOCARCINUS, A. Milne-Edwards.

48 *Nematocarcinus gracilis*, Sp Bte

Spence Bate, 'Challenger' Macrura, p 815, pl. cxxxii, fig 8.

A common species in the Laccadive Sea between 600 and 700 fms Colour in life, red

49. *Nematocarcinus productus*, Sp Bte

Spence Bate, 'Challenger' Macrura, p 810, pl. cxxxii, fig 5

Laccadive Sea, Station 125 1,250 fms New to the Indian fauna

Colour in life, deep crimson

50. *Nematocarcinus tenuipes*, Sp. Bte

Spence Bate, 'Challenger' Macrura, p 812, pl cxxxii, fig 6, and Wood-Mason, Ann Mag Nat Hist, Feb 1891, p 197

Colour in life, bright orange

Laccadive Sea, Station 127, 1,200 fms.

Tribe *ASTACIDEA*

Family **Homaridæ**

PHOBERUS, A Milne-Edwards

51 *Phoberus cæcus*, A Milne-Edwards, var *sublevis*, Wood-Mason.

Wood Mason, Ann Mag Nat Hist, Feb 1891, p 197

A fine female from Station 177, Laccadive Sea, 636 fms

The Indian Museum now possesses both male and female of this rare and beautiful form, the male having been taken in 1890, in the Laccadive Sea, at 740 fms, close to the spot where the female was dredged this year

NEPHROPSIS, Wood-Mason.

52. *Nephropsis stewartii*, Wood-Mason

Wood-Mason, J A S B, 1873, Vol xlii, Pt ii, p 39, pl iv, and Ann Mag Nat Hist, (4) xii, 1873, p 59, and A Milne Edwards, Ann Sci. Nat Zool, (5) xix, pl xx, figs 1-3

A fine female, from the Bay of Bengal, Station 129, 270 fms.

53. *Nephropsis carpenteri*, Wood-Mason.

Wood Mason, Proceedings A S B, 1885, p 70

This species differs from *N stewartii*, specimens of the same size and sex being compared, in the following particulars —

1 The carapace is longer and very much broader, its breadth being about $\frac{3}{4}$ its length, instead of less than $\frac{2}{3}$ its length as in *N stewartii* This is due to the greater inflation of the branchial regions and the much less vertical disposition of the branchiostegite, and may perhaps be merely a *post mortem* difference due to the less rigid nature of the exoskeleton

2 The cervical suture is narrow, deep, almost discontinuous across the mid-dorsal region, and V-shaped, instead of being, as in

N stewartii, broad, perfectly continuous across the mid-dorsal region, and very broadly U-shaped

3. The rostrum is much shorter and straighter instead of being ½ the total extent of the carapace and doubly curved as in *N stewartii*, it is not much more than ¼ the total length of the carapace, and is almost straight, besides being truncated at tip the lateral spines of the rostrum, again, instead of being in the posterior half, are in the anterior half.

4. The abdominal terga, instead of being quite flush as in *N stewartii*, are, from the third to the sixth inclusive, marked with a low fore-and-aft carina.

5. The antennulary peduncles, instead of being between ⅔ and ¾ the length of the rostrum as in *N stewartii*, are almost equal in length to the rostrum, and the antennulary flagella, instead of being little more than half the length of the carapace, are equal to the length of the carapace behind the lateral spines of the rostrum

6. The colour in life, as recorded by Dr Giles, is ivory-white with orange-red markings * Bay of Bengal, Station 162, 145 to 250 fms

54 *Nephropsis atlantica*, Norman.

Norman, P R S, Edinb, 1881—82, Vol xi, p 684, and Wood Mason and Alcock, Ann Mag N it Hist, Feb 1891, p 198, fig 4

The lateral armature of the rostrum is extremely variable, especially in the female, in which sex the rostrum is, occasionally, entirely unarmed

The armature of the abdominal pleuræ also varies, the second pleura, in the female, being sometimes devoid of a spine on the front edge.

Laccadive Sea, Station 145, 696 fms., and Station 177, 636 fms

Tribe *THALASSINIDEA.*

Family **Axiidæ**

EICONAXIUS, Spence Bate

55 *Eiconaxius kermadeci*, Sp. Bte, var *laccadivensis*

Eiconaxius kermadeci, Sp Bte, 'Challenger' Macrura, p 43, pl v, fig 3

A male and a female (the latter carrying large eggs), from the Laccadive Sea, Station 124, 705 fms., differ from Spence Bate's figures and description only in having the meropodite of the large chelipeds unarmed, instead of armed distally with a large spine.

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* The colouration, like that of *Nephrops andamanicus*, and of more than one species of *Munidopsis*, varies somewhat, the specimens taken this year having been coloured pink, with white antennules and antennæ, and with two white tubercles on back.

Length, 20 millim

Colour in life, milk white

Family **Callianassidæ.**

CALOCARIS, Bell

56 *Calocaris macandreæ*, Bell.

Bell, British Stalk eyed Crustacea, p 233, fig , S I Smith, Trans Connect. Acad Sci, Vol V, p 55 (see distribution), Kirk, Tr N Z Inst, xi, 1878, p 401, Lovett, Zoologist, (3) ix, 1885, p 16, Ortmann, Zool Jahrb, vi, 1892, p 50 (see distribution)

A small (33 millim) but nearly perfect specimen of this widely ranging species was dredged in the Laccadive Sea, Station 177, 636 fms, bottom temperature 44 2° Fahr.

In recording this new addition to the Indian fauna we may be permitted to again notice its remarkably wide area of distribution First dredged in Loch Fyne and neighbouring waters up to 180 fms, afterwards in Scandinavian waters up to 217 fms (*fide* Ortmann, *l c*), and then in the Gulf of St Lawrence at 190 fms, it was in 1878 reported (Kirk, *l c*) from the Antipodes, two dead specimens having been found on the coast of New Zealand.

CALLIANASSA, Leach, A. Milne-Edwards

57 *Callianassa cæcigena*, n sp

Belongs to M Milne-Edwards' first section of the genus (A Milne-Edwards, Nouv Archiv du Mus, VI, 1870, p 75), in which it stands alone in having no trace of corneæ, although the eyestalks are well developed and of the usual form It is otherwise close to *C gigas*, Dana

The carapace, which is less than one-third the total length of the body, is of the typical form, and ends in an acute triangular rostrum that reaches to the end of the eyestalks—these being about $\frac{1}{10}$ the total length of the carapace The middle of the three segments into which the carapace is longitudinally divided is gently carinated, the carina culminating, near the posterior border, in a large strong upstanding tooth Of the abdominal terga no two are at all alike either in size or shape The first, which is the narrowest and by far the shortest and has all its angles cockled upwards, is not two-fifths the length of the second which is considerably the longest the second, which is half the length of the carapace (rostrum included), has its postero-lateral angles spinate the third to the sixth inclusive all have on either side, near the antero-lateral angle, a sharp recurrent declivous spine (rudimentary pleura?). the third fourth and fifth are broad, the sixth is long and narrow the telson is as long as the sixth tergum, and is larger than either of the uropods

The eyestalks are of the usual petaloid shape, and, as already mentioned, are devoid of any trace of a cornea

The external maxillipeds are broadly pediform—the ischium being produced at its postero-internal angle to form an operculum the dactylus forms a large, almost circular, plate, thickly beset with hairs Of the first pair of trunk-legs the right is many times larger than the left, and has the following peculiarities of structure —the ischium is spinate along its lower edge the merus has a single small uncinate spine, placed infero-externally, at its proximal end the carpus is considerably less than half the length of the palm of the hand, and has two small spines at its lower angle the hand is longer and broader than the carapace, the palm is carinated along both the upper and the lower edge, the lower edge being also finely serrated the dactylus, which is longer than the 'pollex,' is equal in length to the palm, is broadly phalanged, both outside and inside, above, and has, on its cutting surface, at the proximal end, two short rows of coarse crenulations, the outer of which is continued into a sharp edged ridge the 'pollex' has at its base, close to the dactylar articulation, a strong sharp tooth

The smaller cheliped of the first pair resembles its fellow as to the ischium and merus, but the carpus is more than $\frac{3}{4}$ the length, and the fingers nearly twice the length, of the palm the fingers, besides being relatively much longer, are also much straighter, and, except for a single tooth at the base of the pollex, are unarmed

The second to fourth pairs of trunk-legs much resemble those of *C. gigas* the fifth pair ends in a brush, which owing to the minuteness of the dactylus is only minutely and obscurely sub-chelate

The first pair of abdominal legs (in the female) are short filiform and forked, the outer fork being filiform, the inner being very short, truncate, and ending in a tuft of hairs The second to fifth pairs inclusive are very broadly lamellar, the exopodites and endopodites being nearly equal in size in every case the inner edge of the endopodite carries, near the middle, a small styliform appendage.

Colours in life, ivory white with some scattered yellow-ochre flecks

A single female, 65 millim long from tip of rostrum to end of telson, was dredged in the Bay of Bengal, at Station 172, 200 to 350 fms

Tribe *ERYONTIDEA.*

Family **Eryontidæ.**

PENTACHELES, Spence Bate.

58 *Pentacheles phosphorus*, Alcock.

Alcock, Ann Mag Nat Hist, March, 1894, p 241, and Ill. Zool 'Investigator, Crustacea, pt II, pl VIII, fig 2

Bay of Bengal, Station 172, 200 to 350 fms., and Laccadive Sea, Station 145, 696 fms., and Station 177, 636 fms

The male is much smaller than the female

59. *Pentacheles hextii*, Alcock

Alcock, Ann Mag Nat Hist, March, 1894, p 237.

Laccadive Sea, Station 150, 719 fms.

Tribe *SCYLLARIDEA.*

Family **Scyllaridæ.**

ARCTUS, Dana

60 *Arctus orientalis*, Sp Bte.

Spence Bate, 'Challenger' Macrura, p 68, Pl IX, fig 4

Bay of Bengal, Station 169, 91 fms

New to the Indian fauna.

61 *Arctus rubens*, n sp

Close to *A vitiensis*, Dana

Carapace slightly longer than broad its surface, as in *A tuberculatus*, Sp Bte, is ornamented with squamiform granules which are especially numerous on the prominent median carina, and are especially large and numerous on the branchial regions laterally The lateral dorsal carinæ are very prominent anteriorly, where they overhang the orbit as large spines the antero-lateral spines of the carapace are also very prominent

The posterior border of the carapace, like that of each of the first three abdominal terga, is deeply excised in the middle line

The sternum is traversed, fore and aft, by a row of sharp tubercles—one on each somite—which together form a regularly interrupted carina

The second to fifth abdominal terga are sharply carinated, the carina in the case of the second and third bifurcating behind, and in the case of the fourth and fifth being produced over the succeeding tergum to form a blunt spine. The sides and lateral margins of the terga, like the posterior borders of the pleuræ, are irregularly lobulate or crenulate. The second joint of the antennæ is deeply sculptured above, being traversed obliquely by *two* equally strong and salient ribs its free margins are sharply serrate The fourth joint of the antennæ has its antero-lateral margin 7-digitate

The external maxillipeds, and the trunk-legs, are much stouter than in any other Indian species.

A single female from the Gulf of Manar, Station 151, 142 to 400 fms.

Colour in life, light rose madder above, white below.

Family **Palinuridæ.**

PANULIRUS, Gray.

62. *Panulirus angulatus*, Sp Bte

Spence Bate, 'Challenger' Macrura, p 81, pl xi, figs 2, 3, 4

Numerous fine specimens from the Gulf of Manar, Station 150, 142 to 400 fms

New to the Indian fauna

Tribe *ANOMALA*

Families **Paguridæ** and **Parapaguridæ.**

Our collections in these families are the largest ever made by the 'Investigator' in a single season, and we have been fortunate enough to secure the co-operation of Professor J R Henderson in working them out. Professor Henderson's Report will be published separately.

Family **Galatheidæ.**

MUNIDA, Leach

63. *Munida squamosa*, Hndrsn, var. *prolixa*, Alcock

Alcock, Ann. Mag Nat Hist, April, 1894, p 322.

A number of fine specimens, of both sexes, from the Gulf of Manar, Station 151, 142 to 400 fms.

MUNIDOPSIS, Whiteaves.

64. *Munidopsis stylirostris*, Wood-Mason

Wood-Mason, Ann Mag Nat. Hist., Feb, 1891, p 201, and Alcock, *op. cit* April, 1894, p. 328

Laccadive Sea, Station 177, 636 fms.

65 *Munidopsis dasypus*, Alcock

Alcock, Ann Mag. Nat. Hist, April, 1894, p 329.

Laccadive Sea, Station 177, 636 fms

66 *Munidopsis scobina*, Alcock.

Alcock, Ann Mag Nat Hist, April, 1894, p 330

Bay of Bengal, Station 162, 145 to 250 fms.
Colours in life, white with orange-red markings.

67 *Munidopsis poseidonia*, n sp.

The dorsal integument of body and appendages finely scabrous beneath the usual pubescence.

The rostrum, which is about one-third the length of the carapace proper, is convexly laminar, carinated, and trifid at tip

The carapace is elliptical, convex, and traversed fore-and-aft by a median multispinate ridge,—many of the spines being bifid and trifid the frontal margin is convex and bears two spines, one above the base of either antenna, while just below the frontal margin, between the antenna and the eye, is a spine nearly as long as the eye the lateral margins in front of the cervical groove are sharply quadridentate—the anterior of the four spines having a second spine to its inner side, while behind the cervical groove they are multispinate the posterior margin, like the front edge of the second and third abdominal terga, is multispinate in addition to the spines already noticed there is a pair of large spines on the gastric region, and there are some small spinules on the after margin of the cervical groove.

The eye-stalks are not prolonged beyond the cornea, and are movable The meropodite of the external maxillipeds has, on its inner edge near the proximal end, two large unciform spines, and, at the distal end of its outer edge, another large spine. The chelipeds slightly exceed the fully extended body in length, and are slender the ischiopodite has two distal spinelets, one above, the other below. the meropodite has three series of thornlike spines along its upper and inner surface the carpopodite has a distal ring of spines, and a row of spinules along its inner edge the hand is smooth, the fingers being about three-fourths the length of the palm The second to the fourth thoracic legs have the meropodite and carpopodite spiny along the front edge, and the dactyli, which are about half the length of the propodites, of the usual form

Length of fully extended body 53·5 millim., of chelipeds 58 millim Bay of Bengal, Station 163, 210 fms

This species is nearest related to *Munidopsis scobina.*

68 *Munidopsis trifida,* Hndrsn

Henderson, 'Challenger' Anomura, p 156, pl xvi, fig 2

We identify with this species a single female specimen from the Laccadive Sea, Station 177, 636 fms

Now to the Indian fauna.

[69 *Munidopsis triæna,* n. sp

Closely resembles *M trifida,* Henderson, from which it differs in the following particulars —The middle tooth of the trifid rostrum is relatively longer there is a large spine on the cardiac region the front edges of the second to fourth abdominal terga are armed in the middle line, the second with a large hook-shaped spine, the third and fourth with a pair of spines the chelipeds are much less spiny, the hand being quite smooth, and the carpus having only a pair of distal spines the carpopodites of the second to fourth legs have only a single spine, terminal in position, on the front border

Length of fully extended body 23 millim, of chelipeds 19 5 millim. Andaman Sea, 240 to 375 fms

This small species was dredged several years ago, but was never described or named We introduce it here as we wish to complete our account with a 'key' to the Indian species of the genus]

70 *Munidopsis regia,* n. sp

The entire dorsal surface both of body and of appendages is covered with a remarkably thick velvety down

The rostrum, which is half the length of the carapace proper, is moderately broad, convex, carinated, and armed in its anterior half with a single pair of strong divergent spines.

The carapace is strongly semi-elliptical, and strongly convex, and is traversed fore and aft in the middle line by a raised row of coarse spines—of which three are in the gastric region, one in the procardium and one in the postcardium—in addition to a pair of large spines, disposed transversely, in the front part of the gastric region. the frontal margin is convex, and is armed with two spines, one above the antenna on each side, while below the frontal margin a large spine is interposed between the eye and the antenna the lateral margins are deeply trilobed in front of the cervical groove, each lobe culminating in a spine, while behind the cervical groove is a row of three smaller and successively decreasing spines the posterior border is broadly raised and multispinate

Of the abdominal terga the second has, in the middle line, on the front edge, one strong tooth, while the third and fourth have in the same situation a pair

The eye-stalks are freely movable, and are not prolonged beyond their cornea The thoracic appendages have many long setæ in addition to the general investment of down The external maxillipeds have the meropodite armed, on the inner border, near the proximal end, with two very large unciform spines, and, on the outer border, distally, with a strong spine. The chelipeds are considerably longer than the fully-extended body, but are stout the ischiopodite has two distal spines, one above, the other below the meropodite has three series of strong spines along its inner and upper surface the carpopodite has a distal ring of teeth, and a few sharp tubercles on its upper and outer surface the hand is unarmed, the fingers being about two-thirds the length of the palm The second to fourth thoracic legs have the meropodite and carpopodite spiny in all the dactylus is remarkably long (about two-thirds the length of the propodite) and remarkably hairy on both edges, the posterior edge also being multispinate The telson, which, as is usual in this genus, appears quite plainly to consist of a somite and incompletely fused appendages, has its postero-lateral angles remarkably thickened and recurved, and its lateral borders thickly clothed with setæ of a peculiarly firm consistence and of a dark colour

Colour in life, chalky pink.

Gulf of Manár, Station 151, 142 to 400 fms

This is a large species, the measurements of the single specimen being as follows —

Length of fully extended body from tip of rostrum to end of telson 111 millim Length, from tip of chelipeds to end of telson 205 millim.

71. *Munidopsis trachypus*, n. sp.

Near *M scabra*, Faxon.

Carapace and appendages everywhere closely, sharply, and evenly spinate.

The rostrum, which is about one-third the length of the carapace, is broadly lamellar and trifid, is finely serrated at the sides, and is traversed by a finely serrated carina that extends uninterruptedly to the cervical groove

The carapace is markedly convex and semi-elliptical the frontal margin is strongly convex and is armed with two spines, one above the base of the antenna on each side the lateral margins are multiserrate the posterior margin is raised, and, like the rest of the carapace, is sharply and evenly granular all the regions of the carapace are well delimited.

The abdominal terga are smooth, the telson alone, like the outer halves of the caudal swimmerets, being finely granular.

The eyes are movable, and the eye-stalks are not prolonged beyond their cornea there is a considerable interval between them and the antenna, but no spine

The antennal peduncles are remarkably slender, and are not longer than the eyes (which are not half the length of the rostrum). the flagella appear to have been not longer than the carapace The external maxillipeds are small and slender the meropodite has two large unciform spines (the proximal one slightly bicuspid) on the inner edge near the base, and a large terminal spine on the outer edge

The chelipeds are remarkably long and slender, being, even in the female, nearly twice the length of the fully extended body they are closely thorny, on every surface, up to the base of the fingers the palm is more than three times the length of the fingers The longest of the second to fourth thoracic legs is not much more than half the length of the chelipeds all are densely spiny up to the remarkably short dactyli, which are hardly one-fourth the length of the propodites a spine at the distal end of the meropodite is pre-eminent in all

Length of fully extended body 54 millim, of chelipeds 100 millim Colours in life, pale salmon

Laccadive Sea, Station 177, 636 fms.

[72. *Munidopsis centrina*, n. sp

Belongs to the group *Munidopsis abbreviata*, A. M-E, *M brevimana*, Hndrsn, *M. ciliata*, W.-M., and *M. vicina*, Faxon

The carapace and appendages are remarkably acutely spinose, besides bearing many long coarse stiff setæ

The carapace is strongly semi-elliptical, and is about three times the length of the depressed, acute, simple, carinated, rostrum The strongly convex frontal margin bears four spines, a large one above the antenna on each side, and a smaller one between and behind this and the antero-lateral spine the lateral margins are broken by 5 large spines, 3 of which are in the hepatic, and 2 in the branchial region the posterior margin is raised but smooth · on the gastric region are two transverse rows of spines, four in each row, those of the middle pair of the front row being about two-thirds the length of the rostrum.

The abdominal terga are unarmed, but deeply cross-grooved

The eye-stalks are short and immobile their lower, their outer, and their inner borders are all prolonged as spines beyond the cornea, the inner spine being more than half the length of the rostrum. The spines of the antennulary and antennary peduncles are of remarkable size The meropodite of the external maxillipeds is faintly three-toothed along the inner edge The chelipeds are rather shorter than the ambulatory legs they are acutely spiny up to the hand, which has only the inner edge of the inflated palm slightly spinate the fingers are very short and very broad The 2nd to 4th legs are acutely spinate in every joint except the dactylus, which however has the usual dentations on its posterior margin

Length of fully extended body 39 millim., of chelipeds 26 5 millim. Bay of Bengal, 1520 fathoms.

This species was obtained several years ago, but has never been described or named we introduce it here to complete our survey of the genus in Indian waters]

[73 *Munidopsis pilosa*, Hndrsn

Henderson, 'Challenger' Anomura, p 157; pl xvii, fig 5

This species was dredged in the Andaman Sea, 480 fms, some years ago, and is now recorded as new to the Indian fauna]

[74 *Munidopsis arietina*, n. sp.

Belongs to the *Munidopsis abbreviata* and *brevimana* group, but is distinguished from all its congeners by its enormous up-curved spiny *Heterocarpus*-like rostrum

Carapace semi-elliptical The rostrum, which is acutely styliform and strongly up-curved, is equal in length to the carapace, its tip reaching almost to the end of the fully extended chelipeds its sides are acutely but unsymmetrically spinate

The convex frontal margin is unarmed, except for the antero-lateral spine the lateral margins besides this spine are armed with a second spine in the hepatic region, and a third in the branchial. the posterior margin is strongly spinate on the gastric region are two pairs of spines—a large pair in front, and a small inconspicuous pair behind: on the cardiac region also is a pair of small spines.

The abdominal terga are unarmed

The eye-stalks, which are slightly mobile, are prolonged internally beyond the cornea to form a spine. The meropodite of the external maxillipeds has its inner edge faintly serrated The chelipeds are rather shorter than the ambulatory legs, and have short broad hands. The 2nd–4th legs have dactyli of the usual form.

Length of fully extended body 27 5 millim., of chelipeds 15 millim. Bay of Bengal, 1,520 fms]

75 *Munidopsis unguifera*, n. sp

Distinguished from all its Indian congeners by the form of the dactyli of the 2nd–4th legs, which are long and talon-like, having the posterior edge sharp and entire

The carapace is quadrangular, its surface is coarsely granular, and it is traversed fore and aft by a median carina which is surmounted by a few coarse spines the frontal margin is hardly convex and is quite unarmed, although below it, and between the eye and the antenna, is a spine the parallel lateral margins are acutely bilobed in front of the cervical groove, while behind it they are denticulated the posterior margin is multi-spinate there is a pair of coarse spines on the gastric region

The rostrum, which is about one-third the length of the carapace proper, is depressed, acute, carinated, and simple.

The abdominal terga are unarmed

The eye-stalks are movable the inner margin forms a small papilla upon the summit of the cornea. The meropodite of the external maxillipeds has three small teeth on its inner edge The chelipeds in both sexes are equal to the fully extended body, and are longer and stouter than the other legs they are unarmed, except for a pair of small spines at the distal end of the meropodite the fingers are not much shorter than the palm, and have the cutting edges dentate only near the distal end The 2nd–4th legs have the posterior border of the meropodite serrated in all the dactyli are remarkable for their great length—two-thirds that of the propodites, or more—for their long acute points, and for the sharp blade-like posterior edges.

This is a small species, ovigerous females measuring not more than 25 millim.

Colour, salmon-red to chestnut-brown.

Bay of Bengal, Station 162, 145 to 250 fms.

GALACANTHA, A. Milne-Edwards.

76 *Galacantha areolata*, Wood-Mason

Wood-Mason, Ann Mag Nat Hist., Feb, 1891, p. 200

The free end of the horizontal portion of the rostrum is not always minutely bifid, being sometimes minutely multidentate.

Laccadive Sea, Station 176, 1,070 fms

The Indian Museum now possesses perfect specimens of both sexes.

77 *Galacantha investigatoris*, n sp.

Closely allied to *G bella*, Henderson, from which it differs in the following particulars —

The carapace and appendages are very much more closely scabrous, being everywhere covered with small sharp granulations in close contact, and the spines at the antero-lateral angles are much longer and more acute the horizontal portion of the rostrum is so strongly bifid, that, when viewed from above, the rostrum appears trifid all the abdominal terga and pleurae, with the sole exception of the concealed first tergum, are closely and sharply granular the fingers, though longer than the palm, are relatively shorter than in the Challenger species, and have the cutting edges quite straight the dactyli of the 2nd—4th thoracic legs have the posterior edge 15 to 17-dentate.

Colours in life, body and corneæ milky orange in spirit, white with an uniform dull blue-black suffusion

Length of fully extended body 56 millim, of chelipeds, 36 millim

Laccadive Sea, Station 127, 1,200 fms

78 UROPTYCHUS (A. Milne-Edw), Henderson.

Uroptychus nitidus, A. Milne-Edwards.

A Milne-Edwards, Bull. Mus Comp Zool, Vol viii, 1880, p 62, and Henderson, 'Challenger' Anomura, p 174, pl xxi, fig 6

Laccadive Sea, Station 177, 636 fms

Colours in life, uniform bright pink

New to the Indian fauna

[BATHYANKYRISTES, n g

As *Munidopsis*, but with the trunk-legs, from the 2nd to the 4th, increasingly subcheliform in order of succession, the 4th pair being almost perfect subchelæ, and with the true third joint (the apparent second) of the antennal peduncle furnished at the antero-external angle with an unusually large spine.

79. *Bathyankyristes spinosus*, n sp. Pl IX. fig. 2

Carapace broad, depressed, rather broader behind than in front, but not at all elliptical in shape its surface pilose, and transversely rugose, especially on the branchial regions, but not spinate The rostrum, which is more than half the length of the carapace, is stoutly styliform, upturned, and very acute The frontal margin of the carapace is slightly excavated above the eye (somewhat as in *Aeglea*), and almost transverse, it is unarmed, but a little ventrad of it, between the eye and the antenna, is a stout spine the lateral margins of the carapace are deeply bilobed in front of the cervical groove, each lobe ending in an acute spine, and a third smaller spine occurs immediately behind the cervical groove the posterior border is broadly moulded, and unarmed The abdominal terga are perfectly smooth beneath a close fine pubescence, and ungrooved.

The eyes are unpigmented the eyestalks are not prolonged beyond the cornea The antennules are exactly as in *Munidopsis*, the basal joint being inflated and strongly spinate All the joints of the antennal peduncle are strongly spinate, the spine at the antero-external angle of the true third joint being of significantly large size. The mouth-parts resemble closely those of *Munidopsis*, the expodite of the 1st or anterior maxillipeds being without a flagellum. The external maxillipeds also are much as in *Munidopsis* the antero-external angles both of ischiopodite and of meropodite are strongly spiniform, as is also the antero-inferior angle of the ischiopodite near the middle of the inner border of the meropodite is a single strong spine The trunk-legs are stout and densely hairy The chelipeds are longer than the other legs, but shorter than the fully extended body the ischiopodite has the inner border serrulate up to a distal terminal spine, and has also a distal tooth superiorly the meropodite is strongly and acutely spiny along its upper and inner, and the carpopodite along its inner side, both of these joints having a distal ring of spines the hand, which is a little longer than the fingers, has a few spinules along the inner border the fingers are finely and evenly toothed, and excavated ventrally, just as in *Munidopsis* The 2nd—4th legs have the meropodite and carpopodite strongly spiniferous anteriorly in all, but especially in the fourth, the propodite is enlarged at its distal end and there has its posterior border produced to form a compressed dentigerous tubercle, against which the basal portion of the dactylus can be flexed to form a sub-chela · in the second pair of legs the tubercle carries two or three teeth, in the third pair five or six, and in the fourth pair, which are almost typical sub-chelae, six or seven the dactyli are stout, and are minutely serrated only in that part of their posterior border which is opposed to the tubercle on the propodite. The fifth pair of trunk-legs is of the ordinary Galatheid form.

In the female the 2nd—5th pairs of (uniramous) abdominal appendages are present, increasing in size from before backwards. The telson and caudal swimmerets resemble those of *Munidopsis*, etc.

Length of fully-extended body 70 millim., of chelipeds 59 millim.

Andaman Sea, off Ross Island, 265 fms.]

80. *Bathyankyristes levis*, n. sp.

Closely resembles the preceding species, from which it differs only in the following particulars:—The rostrum is broader and more depressed, and is only half the length of the carapace: the cornea is relatively much larger—no part of the eye-stalk being visible from above: the chelipeds are much less spiny: the 2nd—4th pairs of trunk-legs have the meropodite and carpopodite quite unarmed, except for a distal spine above and below: the abdominal terga are in closer contact.

In the male the 1st and 2nd pairs of abdominal appendages resemble those of *Munidopsis*, and the 3rd—5th pairs, as in *Munidopsis*, are minute rudiments.

Length 29 millim., of chelipeds 27 millim.

Laccadive Sea, Station 177, 636 fms.

Sub Order BRACHYURA.

Tribe *ANOMOLA.*

Family **Raninidæ.**

LYREIDUS, de Haan.

81. *Lyreidus gracilis*, Wood-Mason.

Wood-Mason, J. A. S. B., Vol. LVI, pt. ii, 1887, p. 376.

Gulf of Manár, Station 151, 142–400 fms.

Family **Dromidæ.**

DROMIDIA, Stimpson.

82. *Dromidia Kendalli*, n. sp.

Carapace globular, covered, like the appendages, with a dense fine short yellowish fur.

The rostrum is deeply bifid, and is without any trace of a median tooth: the margins of the two teeth are strongly deflexed, and pass backwards to traverse obliquely the roof of the orbits as a prominent ridge, the point where they meet the upper margin of the orbit being marked by a distinct notch the orbit is thus imperfectly sub-divided into two chambers, an inner lodging the root of the eye-stalks, and an outer into which the eye can be reflexed, much recalling the mode of formation of the orbit in *Homola* The inferior orbital tooth is small and inconspicuous

The convex antero-lateral margin of the carapace bears a few small distant granules, arranged in two sets separated by a slight indentation which probably corresponds to the anterior division of the cervical groove, but only the last granule of the front set is at all conspicuous the equally convex postero-lateral margin is, like the branchiostegal region, very finely granular The cervical groove, though not deep, is conspicuous it traverses the lateral wall of the carapace to end at the antennal fossa, enclosing between itself and the antero-lateral border of the carapace two oval bosses the pterygostomian region internal to the groove is the most coarsely granular portion of the carapace.

The sternal sulci unite opposite the base of the chelipeds.

The convexity of the cornea is markedly deficient in pigment The antennal flagellum is unusually long The efferent branchial opening is remarkably patulous The trunk-legs, in form and proportion, much resemble those of *D. rumphii.* In the chelipeds the meropodite has the edges finely and sharply granular, the granules encroaching slightly on the neighbouring surfaces, the carpus has the upper and outer surfaces finely granular, the granules being disposed in longitudinal lines, the hand is finely and distantly granular, and the fingers are very indistinctly dentate except at the tips

Length of carapace 18 millim., breadth 19 millim.

Bay of Bengal, Station 159, 112 fms

Family **Homolidæ.**

HOMOLA, Leach.

83. *Homola megalops*, Alcock.

Alcock, Ann Mag Nat Hist, May, 1894, p 408

Gulf of Manár, Station 151, 142–400 fms., and Bay of Bengal, Station 162, 145–250 fms

Tribe *OXYSTOMATA*

Family **Dorippidæ**

ETHUSA, Roux.

84 *Ethusa indica*, Alcock

Alcock, Ann Mag Nat Hist, May, 1894, p 405

This species, first dredged in the Bay of Bengal, at 240 fms, now appears in the Laccadive Sea, Station 145, 696 fms, and in the Gulf of Manár, Station 151, 142–400 fms.

ETHUSINA, Smith.

85. *Ethusina gracilipes*, Miers.

Miers, 'Challenger' Brachyura, p. 332, pl. xxviii., fig. 3.

This species, dredged by the 'Challenger' in the Arafura Sea and neighbouring basins of the Eastern Archipelago at 700–1,425 fms., is now found in the Laccadive Sea, Station 127, 1,200 fms.

Its colour in life was milk-white, with the tips of the legs faint pink.

Family **Leucosidæ.**

RANDALLIA, Stimpson.

86. *Randallia coronata*, n. sp.

Carapace globular, finely and closely granular beneath a dense pubescence. Besides granules there are numerous conical tubercles of nearly uniform, rather large, size,—one bordering upon the hepatic and pterygostomian regions, five on the branchial region, two rather larger than the others on the posterior border, one near the after limit of the gastric region, and two close together in the centre of the extremely well-defined cardiac region: a majority of these tubercles is disposed with such regularity and symmetry as to form a crown round the gastric region.

For the rest, the species very closely resembles Stimpson's type (Boston Journal of Natural History, Vol. VI., 1850–1857, p. 471, pl. xx., fig. 3), except that the front is much less produced, and that the chelipeds are much more finely granular.

Length of carapace 16 millim., breadth 17 millim., length of cheliped 23 millim.

Bay of Bengal, Station 159, 112 fms.

PARILIA, Wood-Mason.

87. *Parilia Alcocki*, Wood-Mason.

Wood-Mason, Ann. Mag. Nat. Hist., March, 1891, p. 264, and Ill. Zool., 'Investigator,' pl. v., figs. 3, 3a.

This species was taken at almost every haul in the Bay between 91 and 250 fms.

The figure (fig. 3) in the 'Illustrations,' gives a very inadequate idea of this fine species.

Family **Calappidæ.**

CALAPPA, Fabr.

88. *Calappa exanthematosa*, n. sp.

Carapace oval, remarkably inflated, especially in the branchial regions which are marked off from the gastro-cardiac regions by a particularly deep furrow its length is about two-thirds its greatest breadth immediately in front of the lateral shields: its surface in the posterior half, except for a few marginal granules, is smooth, but in the anterior half is covered with numerous large smooth isolated mammillary tubercles, which by their colouration (red base and shining yellow apex) exactly resemble ripe small-pox pustules In the posterior half of the carapace the place of these well-defined "pustules" is taken by equally well-defined round or oval slightly-raised red patches, which exactly resemble the "papules" of the earlier stage of small-pox

The front is rather broad for *Calappa*, and is excavated, as usual, so as to appear bilobed The arch of the antero-lateral margin is anteriorly faintly and irregularly crenulate, but posteriorly is bluntly dentate The clypeiform expansions of the postero-lateral margins are little developed—hardly breaking the general curve—and are armed each with seven or eight teeth, all of which have a bluntly serrated edge The posterior margin proper—that part, namely, which is co-extensive with the first abdominal segment—is finely beaded

The abdomen resembles that of other species of the genus, being narrow in both sexes, and the 3rd—5th segments in the male being fused, though distinctly recognizable

The eyes and orbits, the antennules, and the antennæ, conform to type, but the external maxillipeds are even less operculiform than usual in the male sex The chelipeds have the usual form the transverse crest of the merus, which meets the lateral shield of the carapace at an angle very much wider than a right angle, is well marked, and is quadricuspid · the carpus and the palm, on their outer aspect, are marked with "pustules" similar to those on the anterior part of the carapace. the whole antero-inferior surface of the hand is closely covered with bead-like granules the crest of the palm is sexcuspid the fingers have the usual dissimilarity, those of the right side being coarser, and less mobile, those of the left side being slenderer, more finely and evenly toothed, and more mobile

The second pair of abdominal appendages, in the male, are long and vermiform, and are enclosed each in a tube formed by the inrolling of the parts of the first pair

Two males—the largest measuring 116 millim across the carapace proper, and 126 millim across the arch formed by the adducted chelipeds—from Stations 159 and 170, 112 and 107 fms respectively and three small females from Station 169, 91 fms

This species is remarkable among its congeners, not only from the unusual depth of its habitat, but also for its great size and remarkable colouration

MURSIA, Desm.

89. *Mursia bicristimana*, n. sp.

This species bears a general resemblance to *Mursia armata*, de Haan, but differs in the following particulars:—

The carapace is relatively wider, the lateral spines shorter and slenderer: the granular prominences on the upper surface form seven distinct rows, the most external row losing itself on the antero-superior surface of the lateral spine, the other rows occupying the same position as in *M. armata*. The rostrum ends in three teeth, the middle one of which is sharp and prominent, the lateral ones being more obtuse than in *M. armata*. The antero-lateral margins are armed with eleven denticles, the last of which is very small. The postero-lateral margins are slightly cristiform and microscopically granular. The posterior margin is faintly trilobed, the median lobe being hardly distinct, and the lateral lobes being mere papillæ and not spines as in *M. armata*. The hands, in addition to the high dentate crest of the upper margin, are longitudinally traversed at the lower limit of their outer surface by a sharp crest, the edge of which is unevenly trilobed, the proximal lobe being short acute and spiniform, the middle lobe being broad and obtuse, and the distal lobe being narrow and obtuse: the lower edge of the hand is finely, closely, and sharply serrate: the meropodite of the chelipeds bears two spines at its distal end, the outer of which is about three times the length of the inner.

Colour in life, salmon pink.

Length of carapace 21 millim., breadth, from tip to tip of lateral spines, 41 millim.

Gulf of Manár, Station 151, 142–400 fms.

Tribe *CATOMETOPA*.

Family **Gonoplacidæ**.

The crab that we have now to describe is the most singular and interesting form in the whole collection.

At first sight, from its general shape, from its elongate third pair of trunk-legs and its almost rudimentary notopodal fifth pair, from its extremely incomplete orbits, from the absence of antennulary fossæ, and from the curiously small and slender external maxillipeds, Homolid affinities are suggested, but that our species has nothing to do with the *Homolidæ* is shown (1) by the position of the openings of the oviducts, which is typically cancroid, (2) by the form and position of the openings of the efferent ducts of the male, which are typically Catometopan, and (3) by the number and disposition of the branchiæ, of which there are only six on each side.

In the number and arrangement of the branchiæ, as well as in the position and degenerate form of the fifth pair of legs, it might be supposed, from a verbal acquaintance with the animal, that it had affinities with the *Dorippidæ* (*Dorippe* and *Ethusa* more especially). That this is not the case is shown (1) by the position, above indicated, of the genital openings of the male, (2) by the great broad buccal orifice, which is only very partially covered by the maxillipeds, (3) by the form of the carapace, which is broad, and completely covers the thorax, (4) by the form of the antennules, which are not obliquely or almost vertically folded in distinct fossæ as they are in *Ethusa* and *Dorippe*, and (5) by the form of the sternal plastron, which in our new form is a broad pentagonal plate as in many Ocypodoids

Although not nearly related, then, to the typical Dorippid, it certainly has considerable affinities with one of the forms generally ranked with *Dorippe*, namely, with *Cymopolia*

It resembles *Cymopolia* (1) somewhat in general form, and (2) in the fact that the maxillipeds are small and do not nearly cover the orifice of the large squarish buccal cavity, but it differs from *Cymopolia* (1) in the incompleteness of the orbits and antennulary fossæ, and (2) in having the front narrow and deflexed.

Its resemblance to *Cymopolia*, however, is chiefly of interest as indicating the proper position of *Cymopolia* itself, for this new Cymopolia-like form of ours, for which we propose the name of *Archaeoplax*, is quite clearly related to the "*Gonoplaciens*" among the Catometopa, in which section its nearer affinities are, perhaps, with the Macrophthalmines, as we hope the following description will show.

ARCHAEOPLAX, n gen

Carapace transverse, greatly depressed, with the front very narrow, and declivous, yet forming a distinct rostrum (*i e.*, its front border is not fused with the epistome, but is free) Abdomen in both sexes narrow, not nearly co-extensive in breadth with the sternum between the penultimate pair of trunk-legs *Orbits and antennulary fossæ very imperfect* (hardly more perfect than in *Homola*). Eye-stalks long, slender, tapering eyes small. Antennules well developed, transversely folded on the inflated basal joint, *which is free and exposed from its origin.* Antennal peduncles arising below the orbit, and external to, and in the same plane with, the antennules · the flagella long Buccal opening much wider in front than behind, not nearly covered by the short slender external maxillipeds efferent branchial channels produced and patulous epistome linear the carpopodite of the external maxillipeds articulates with the apex of the narrow meropodite.

Chelipeds unequal in the male, sub-equal in the female · second, third, and fourth pairs of trunk-legs long and slender (the third pair the longest), with long sabre-shaped dactyli. *Fifth pair of trunk-legs reduced to feather-like rudiments, arising close together, high up, almost on the back* Genital ducts of the male opening at a distinct tubercle on the base of the fifth pair of legs, the tubercle being embedded in a notch in the posterior border of the sternum

90. *Archaeoplax notopus*, n sp, Pl. IX., figs 3, 3a, 3b

Carapace extremely flat and depressed, transversely oval, with the anterior and antero-lateral margins broadly excised, its surface punctate beneath a shaggy reddish fur.

The front proper is extremely narrow—about one-fourteenth the greatest breadth of the carapace—and is deflexed with the tip free and horizontal, the tip also being slightly expanded and bilobed just as in *Macrophthalmus.*

The anterior border of the carapace, which is half the greatest width of the carapace, is concave on either side of the front, each concavity being interrupted near the middle by a small projection the antero-lateral borders are very short, are broadly excised or concave, and are rather acutely produced at their junction with the anterior margin the postero-lateral borders, which constitute four-fifths or more of the lateral extent of the carapace, are convex, and form a small lateral spine at their much-advanced junction with the antero-lateral borders the posterior border is raised and gently convex The inflated branchial regions are fairly well delimited from the gastro-cardiac regions

Two remarkable almost straight sutures, unlike anything known to us, cross the carapace from side to side the anterior at the level of the junction of the antero-lateral with the postero-lateral borders, the posterior at the middle of the cardiac region. These sutures are remarkably distinct, equally from the exterior and from the interior of the carapace their exact relations will be described presently

The branchiostegal and pterygostomian regions form nearly a right angle with the dorsal surface of the carapace, and the pterygostomian region has a wide oblique fold or groove leading to the afferent branchial orifice. The sternum is widely pentagonal.

The orbits are remarkably incomplete, their inferior border being formed only by a large acute lamelliform spine and by the basal joint of the antennule

The eye-stalks are long (their length being contained 6 or 7 times in the greatest breadth of the carapace), slender, tapering, and slightly bent the eyes are small and hemispherical.

The antennules have the basal joint hugely inflated, globular, quite free and exposed from its origin, and freely mobile the second and third joints, which are long and slender, fold transversely on the base of the first

The antennæ arise just below the infra-orbital spine, and outside and in the same line with, the antennules their flagellum is half the length of the carapace

The buccal cavity is considerably wider in front than behind the external maxillipeds are so small and slender as to leave completely exposed the mandibles, the wide endostome, and a part of the wide and produced efferent branchial channels

The epistome is linear The fourth joint of the external maxillipeds arises from the apex of the small oval third joint

All the trunk legs are thickly fringed with a shaggy reddish hair

The chelipeds are subequal in the female, but are unsymmetrical in the male their length, half of which is formed by the hand, slightly exceeds the breadth of the carapace both hands in the female, and the smaller hand in the male, are elongate compressed and sharp-edged, and have the fingers curved compressed acute, slightly excavated on the inside, and indistinctly dentate along the opposed edges the larger hand of the male has the palm inflated

Of the 2nd–4th trunk legs the 3rd pair is the longest, measuring rather more than twice the greatest breadth of the carapace all are slender compressed and quite smooth, and all end in long sharp sabre-shaped dactyli

The 5th pair of trunk legs is quite unique in form and disposition they arise quite close to the middle line of the body and high up, almost on the back, they are short, being considerably less than the breadth of the carapace in length, and are very slender and flexible, and they are so thickly fringed with shaggy hairs as to appear like feathers

The abdomen in the male consists of 5 separate pieces—the 3rd–5th segments being coalescent its breadth opposite the penultimate pair of trunk-legs is about one-third that of the sternum at the same point. In the female the abdomen consists of 7 separate segments, and its breadth opposite the penultimate pair of trunk-legs is half that of the sternum at the same level The genital openings in the female have the usual position on the sternum in the male they are placed at the summit of a prominent tubercle situated at the antero-internal angle of the basal joint of the 5th pair of legs, the tubercle being embedded in a notch in the posterior border of the sternum

The figure represents a life-size male, so that we do not give a table of measurements. Colours, chestnut-brown, carapace lighter eggs scarlet

Bay of Bengal, at almost all stations off the Coromandel Coast, from 14° southwards, between 100 and 250 fms

The sutures on the carapace of Archaeoplax notopus—

The anterior of the two sutures above-mentioned crosses the carapace from side to side at the level of the junction of the antero-lateral and postero-lateral borders. In front of it the carapace is declivous. Upon the sides of the carapace this suture is continued downwards and forwards to meet the epimeral suture—here somewhat creased and indefinite—in which it is lost

The posterior of the two sutures crosses the carapace from side to side, parallel with the first, passing through the middle of the cardiac region. It is lost in a dimple high up on the branchiostegal region

What these sutures mean we hardly venture to surmise. They are far too conspicuous—being as plainly visible on the interior of the carapace as they are on the exterior—to be mere adventitious markings If, as is possible, they indicate lines of fusion of segments, then they do not support the classical explanation of the formation of the entire Brachyuran carapace out of the antennary and mandibular segments, since the epimeral suture is also present, as well as a double posterior border.

Family **Ocypodidae**

PSOPHETICUS, Wood-Mason

91 *Psopheticus stridulans*, Wood-Mason.

Wood-Mason, Illustrations of the Zoology of H M I M S 'Investigator,' Crustacea, part I pl V fig 1, and Alcock, Annals and Magazine of Natural History Ser 6, Vol XIII, May, 1894, p 402

Gulf of Manár, Station 151, 142-400 fms

Tribe *CYCLOMETOPA*

Family **Cancridae.**

NECTOPANOPE, Wood-Mason

92 *Nectopanope longipes*, Wood-Mason.

Wood Mason, Ann Mag Nat Hist, March, 1892, p 262

Laccadive Sea, Station 177, 636 fms

XANTHODES, Dana

93 *Xanthodes microps*, n. sp

Very closely allied to *Xanthodes pachydactylus*, A Milne-Edwards (Nouv Archiv. du Mus., 1873, p 201, pl VI, fig 4), from which it appears to differ only (1) in having the branchial regions more inflated, leading to a pushing forward of the hepatic regions and a shortening and straightening out of the antero-lateral border of the carapace, (2) in the very much smaller eyes, and (3) in the greater inequality of the chelæ in the male

Colours in life, chestnut-brown with black fingers, corneæ hardly darker than the rest of body.

Length of carapace, 11–12 millim. Breadth of carapace, 17 millim. Length of large cheliped, 26 millim

Bay of Bengal, Station 159, 112 fms. Station 170, 107 fms. and Station 172, 200–350 fms.

Family **Portunidæ**

GONIOSOMA, A Milne Edwards

94 *Goniosoma hoplites*, W-M MS. (name only)

Belongs to Milne-Edwards' second section of the genus (Archiv. du Mus, tom X, p 385), in which it comes nearest to *G affine*, Dana (U S Expl Expd, Crustacea, Vol. I, p. 286, pl xvii, fig 12, and De Man, J. L. S Zool. Vol XXII, 1888, p. 80, pl v, fig. 2)

Differs from *G affine*, as identified by De Man, in the following particulars (1) The carapace is much wider, being in both sexes nearly twice as broad (measured from tip to tip of last antero-lateral spine) as long, (2) owing to the remarkable inflation of the branchial regions the transverse granular line that proceeds from the last antero-lateral spine is strongly convex anteriorly, rather than transverse, and is not continued across the gastric region, (3) the frontal teeth are broad and very blunt, and fall into three groups, a middle group of four separated by widish notches from a pair on either side; (4) the first five teeth of the antero-lateral margin are sharply multi-serrate, but the sixth tooth is a true spine, and in the male is three times as prominent laterally as any of the others, (5) the inner lobe of the lower margin of the orbit is broader and even more prominent, (6) the upper and outer surfaces of the hand have only four spines—two along the inner margin, and two along the outer

The largest male measures as follows —

Length of carapace 23 millim., breadth 43 millim Length of cheliped 51 millim.

Colours in life, light salmon-pink, clouded on carapace.

At most stations along the Madras Coast at and near 100 fms.

Tribe *OXYRHYNCHA*

Family **Inachidæ.**

ANAMATHIA, S. I. Smith.

95. *Anamathia beauchampi*, n. sp

Very closely resembles *A. tanneri*, S. I. Smith [P U S. N. M. Vol. vi 1883, p. 4, and 'Albatross' Crustacea in Rep Comm Fish for 1885 (1886), pl. i., fig 4] from the description and figure of which it differs only in the following points:—(1) The carapace and appendages are thickly covered with stout clavate hairs, beneath which on the carapace is a dense felty pubescence, (2) the rostral horns (in the female) are not quite so long, being less than half the length of the rest of the carapace, (3) the great epibranchial spines are more erect, (4) the præ-ocular spines are smaller, being much smaller than the post-orbital processes, (5) the eyes are smaller, and the cornea is almost devoid of pigment

An egg-laden female from Bay of Bengal, Station 163, 210 fms.

Extreme length of carapace 21 millim, extreme breadth 14 millim.

Order ISOPODA.

Family **Bathynomidæ**

BATHYNOMUS, A Milne-Edwards.

96 *Bathynomus giganteus*, A Milne-Edwards

A Milne-Edwards, Comptes Rendus, 1879, tom lxxxviii, pp 21–23, A Agassiz "Three Cruises of the Blake," Vol II, p 49, fig 252; and Wood-Mason and Alcock, Ann Mag Nat Hist, March 1891, p 270

Laccadive Sea, Station 145, 696 fms.

It is interesting to note that this species was deliberately dredged for as near as possible to the spot where it was first taken by the Investigator' in 1890, and with a successful result.

Natural History Notes from H. M Indian Marine Survey Steamer 'Investigator,' Commander C F Oldham, R N, commanding. Series II., No. 15. *On some New and Rare Corals from the Deep Waters of India* *By* A ALCOCK, Superintendent of the Indian Museum.

[Received 1st September]

The species here referred to were dredged during the last voyage (1893–94) of the 'Investigator'

COELENTERATA NEMATOPHORA

I HYDROMEDUSÆ.

The only Hydromedusoid met with in the deep sea was a *Conopora*, apparently identical with *Conopora tenuis* Moseley, dredged off the Maldives in 719 fms. The base of the cœnosteum is contorted to form a tubular refuge for a polychætous worm

This species is new to the Indian record.

II MADREPORARIA

The following well known deep sea forms were again dredged —

1 *Caryophyllia communis*, (Seguenza), Moseley from the Laccadive Sea, 1,070 fms

2. *Flabellum japonicum*, Moseley from the Laccadive Sea, 636 fms

3 *Bathyactis symmetrica*, (Pourtalès) from off the Maldives, 719 fms

In addition to these the four following species, three of which, though very closely allied to species already known, appear to be new —

4. *Caryophyllia scillæomorpha*, n sp

[Cp *Ceratocyathus scillæ*, Seguenza, Mem Accad Sci. Torin, (ii) XXI, 1864, p 442, Tav V, figs 5, 5a—c]

The present species resembles *Ceratocyathus scillæ*, from the Tertiaries of Messina, in every particular, except that the apex is not exactly in the middle line of the compressed face of the corallum, and that the pali are only 15–16 instead of 20 in number As we have only three small specimens, two of which moreover are dead and eroded, we do not know how far these differences are constant

It may be mentioned, in this connexion, that two other contemporaries of *Caryophyllia* (*Ceratocyathus*) *scillæ*, namely *C communis*, Seg, and *Flabellum laciniatum*, Phil , are both common in the depths of Indian waters.

The present species was taken off Madras at 107 fathoms.

5 *Rhizotrochus crateriformis*, Alcock

Alcock, J A S B , Vol LXII , Pt 2, 1893, p 2, Pl. VIII , figs 1 & 2

Of this species, a living specimen of which was dredged last year in 573 fms , three large specimens were obtained this year off the Madras Coast in 33 fms.

In all three specimens the living coral has arisen apparently by budding from the centre of the calicular fossa of its parent, killing the parent, and completely filling and impacting its dead corallum

6 *Flabellum pari-pavoninum*, n sp

This species is very like *F pavoninum*, Less , and *F distinctum* E & H

From the former, which it most closely resembles, it differs only in the following particulars —(1) the compressed sides of the corallum are markedly concave, owing to an eversion of the rim of the calicle that brings the relation of the axes to about 100 125 , (2) the calicular fossa is consequently much wider and more open (3) the septa are extremely thin, and show hardly any crenulation of the free edge.

Colours, pale madder, the septa gradually paling to white

Height of corallum, 39 millim Major axis of calicular orifice 37 5 millim , minor axis 30 5 millim

From the Laccadive Sea, 636 fms

7 *Stephanotrochus oldhami*, n sp

Very near to *S nitens* (Ann Mag Nat Hist , Jan 1891, p 7), being of the same bowl-shaped form intermediate between the platter-shaped and cup-shaped extremes of the species figured in the 'Challenger' Report

The epithecate base is very gently convex, and culminates in a scar of attachment the side-wall arises vertically, afterwards curving slightly outwards.

On the base only the primary and secondary costæ are conspicuous, being also coarsely spinate, while the costæ of the next two cycles are indistinctly represented by raised rows of granules on the side-wall, although the primary and secondary costæ are still as prominent as before, they are much more distantly spinate, and, like the now very prominent tertiary and quaternary costæ, are coarsely and closely granular.

There are six systems of septa, with four complete cycles and an incomplete fifth. Those of the first two cycles are co-equal: they are coarsely granular, and they unite in the centre of the calicular fossa to form a loose columella of 3 or 4 slightly twisted leaves: just before their union each septum rises to form a low palus The tertiary septa unite with the secondaries usually at the level of these pali. The septa of the other cycles are low crenulate ridges, which, however, descend deeply into the calice.

Diameter of calicular orifice 1 inch.

Laccadive Sea, 636 fms

We name this species after our friend and colleague Commander C. F. Oldham, R N.

Natural History Notes from H M. Indian Marine Survey Steamer "Investigator" Commander C F Oldham, R N, commanding.—Series II, No 16. *On the Echinoidea collected during the Season* 1893-94 *By* A. R S ANDERSON, B A, M.B., *Surgeon-Naturalist to the Survey.*

[Received 10th September]

Order CIDAROIDA.

Family **Cidaridae.**

PHYLLACANTHUS, Brandt.

1 *Phyllacanthus annulifera,* Lamarck

A Agassiz, Revision of the Echini. pp 387, 388, pl Ie f 21-26a

Coromandel coast; 7 fms.; sandy bottom.

DOROCIDARIS, A. Ag.

2 *Dorocidaris tiara,* n sp

The test of this species varies a good deal in shape according to age. In the smaller specimens it is depressed both actinally and abactinally, but in larger examples, while the actinal surface remains flattened, the abactinal becomes high and somewhat conical but with the apex truncated The ambital outline is pentagonal with rounded angles

The apical system is of moderate size—about ⅓ the diameter of the test—and pentagonal; the basal and radial plates together form a flattened, slightly sunken area, within which the periproctal area arises as a gently rounded eminence.

The basal plates are large and triangular with rounded apex, and the sides, where in contact with the radial plates, gently concave; the madreporic slightly exceeds the other plates in size; they are prevented from contact with each other by the periproctal plates which intrude either broad or very narrow processes between each pair of basal plates. The genital pores are large, circular, situated in the outer third of the plates, and partly occluded by a delicate membrane. The basal plates—except at the edges, which are smooth—are sparsely covered by large granules which tend to arrange themselves in two groups; one forms a couple of concentric circles round the genital pore—the inner circle consisting of smaller granules than the outer, the other group is confined to the base of the plates and is included within a curved line of granules which stretches from end to end of the abactinal side of the plates. The madreporite is covered in its whole extent by granules slightly smaller than those on the other plates

The ocular plates are broadly heart-shaped, are covered, except at the edges, with large granules, and have the transverse slit-like ocular pore situated at a short distance from their actinal margin

The periproctal plates form a pentagon with somewhat prolonged angles, which, passing between the basal plates, come into contact with the radial plates, the plates of the outer row are large, polyhedral, 9–11 in number, and have a central patch of large granules, the inner rows are similar to the outer but smaller.

The ambulacra are broad, almost straight and transversely flat; occasionally they form prominent elevations where they meet the apical system The poriferous is very slightly narrower than the interporiferous zone, below the level of which and of the interambulacra it is a little sunken, no groove connects the pores of a pair together, and only an exceedingly small ridge separates adjacent pairs of pores, the pores are large and oval. The interporiferous area is ornamented with four rows of granules, the marginal being much larger than the inner rows In addition to these rows a few scattered minute granules are also present A narrow space on each side of the central suture is bare

The interambulacral area is about 2½ times the breadth of the ambulacral, the plates are few in number, 7–8, longitudinally elongated abactinally, transversely elongated actinally, and at the ambitus are about as long as wide; they are clearly defined from one another by slightly sunken, bare longitudinal and transverse sutures, from a short distance above the ambitus to the peristome each is ornamented with a small, glassy, perforate mamelon, mounted on a wide but low, conical, plain boss surrounded by a slightly sunken scrobicule. The first and second interambulacral plates from the apical system bear longitudinally elongated bosses with very minute imperfect mamelons, the first plates never and the second very seldom bear primary spines When the test is looked at from above only two or three perfect mamelons are seen at the ambitus of each interambulacrum Near the ambitus the scrobicules form circles, but actinally, as they approach the peristome, they diminish rapidly in size, and, like the bosses, become more and more transversely elongated. Surrounding the scrobicule is a row of secondary tubercles many of which resemble the primary tubercles in structure Beyond this row the plates are covered with a few large tubercles and miliaries The abactinal plates are much barer of granules than those situated at the ambitus or actinally

The peristome is circular, the membrane is flush with the test, flat, and covered with imbricate scales each bearing a row of granules on the summits of which short flattened spines are seated. Buccal opening pentagonal

The primary spines, at the ambitus, are about 1½ times the diameter of the test in length, thin, gently tapering from base to apex, and eight-ribbed, the ribs are plain elevations and non-granular The spines are solid but so brittle, especially in the larger specimens, that very few, if any, intact spines are found on any one test The colour of these spines is a pale pink, most marked at the base, and towards the extremity changes into a pale olive green Actinally the primary spines are short, flat and white

The secondary spines, which are seated on the row of tubercles surrounding the primaries, and on the outer row of granules of the interporiferous areas, are olive green with a darker, longitudinal, central band

The colour of the test is chestnut brown, with a green shade abactinally, which green color is very marked in the apical system.

Diameter	Height	Diameter of actinal syst	Diameter of abact syst	Diameter of ambulacra	Diameter of interambulacra	Lenghth of spines	No of coronal plates
26	19 25	10·5	12	4	11·75	38	6
31	24	12	13	4·75	13	42	7
35	30	14	15·25	6	15 5	—	7
42	33 3	14 75	17	7	18 5	—	8

Numerous specimens from 142–400 fms., off Colombo, bottom, brown mud

3 *Dorocidaris alcocki*, n. sp.

The test is circular in outline at ambitus, but greatly flattened both actinally and abactinally The apical system is large, basal plates wide, pentagonal, and in contact with each other, completely exclude the radial from meeting any periproctal plates The genital pores, situated in the outer part of the basal plates, are surrounded by a row of granules and are generally very large. The madreporic plate is not markedly larger than the others. The radial plates are semilunar in shape, about ⅓ the size of the basal plates, and have their outer margins bevelled, from above downwards and outwards. The small ocular pores are situated in these bevelled portions, into which the apical ambulacral plates also slightly project The anal plates form a pentagon, those of the outer row are much larger than the inner ones and vary much in shape, usually they are 8 in number. The anus is small, central and surrounded by a ring of small plates. All the plates of the apical system are very coarsely granular except at their margins which are smooth. Each granule carries a small flattened spine.

The ambulacra are slightly sinuous, the poriferous area is sunken and equals the interporiferous in width The pores are close together, and those of each pair are connected by a slight groove On each margin of the interporiferous area is a row of large granules, within these two marginal rows are two other slightly irregular rows of smaller granules A narrow space down the middle of the interporiferous area is bare

The plates of the interambulacral areas are roughly pentagonal in outline, few in number (5–6), and each carries a small perforate mamelon mounted on a small conical plain boss, the scrobicules are large, sunken, circular and surrounded by a row of large granules The remainder of the plate beyond this row is covered with granules similar to those on the plates of the apical system The median interambulacral suture is zig-zagged, sunken and bare

The peristomial area is large, slightly sunken and sub-pentagonal. The peristomial membrane is covered with imbricate, granular plates bearing small spines

The primary ambital spines are few in number, very long—more than 2½ times the diameter of the test—gradually tapering from the slightly constricted neck to the tip, and are covered with denticles, with their points distally directed, arranged in about 12 longitudinal ridges, one of which frequently projects, buttress-like, in the proximal third of the spine. The primary spines arising from the primary actinal tubercle are short, flattened, and project inwards so as to cover the actinal membrane

Surrounding each primary spine, and reaching as far as its milled ring, is a row of flat secondary spines

Colour; of test, secondary and smaller spines, madder purple, of primary spines light-pink, most marked in proximal half

Diameter	Height	Diameter of actinal syst	Diameter of abact syst	Diameter of ambulacra	Diameter of interambulacra	Length of spines.	No of coronal plates.
26	16 75	9 5	13 5	4	12	56	5
25 75	16 75	9	12 75	4	12	68	6

Station 177 Laccadive Sea, 636 fms, bottom temp 44·2° F.; bottom green mud

Order DIADEMATOIDA

Family **Echinothuridae**.

Phormosoma, Wy. Thom.

4 *Phormosoma bursarium*, A. Agassiz

'Challenger' Echinoidea, pp 99–101, pl x^{b}

Station 176· Laccadive Sea, 1070 fms., bottom temp 37° 5 F, bottom green mud.

Station 177 Laccadive Sea, 636 fms., bottom temp 44° 2 F., bottom green mud

5. *Phormosoma luculentum*, A Agassiz.

'Challenger' Echinoidea, pp 97–99, pls ix, x, x^{a}, figs 3–7

Station 145 Laccadive Sea, 696 fms, bottom green mud

Family **Diadematidae**

Astropyga, Gray.

6 *Astropyga radiata*, Leske.

A. Agassiz, Revision of the Echini, pp 420–422, pl xxiv, fig 40

One large specimen was trawled in 28 fms off the east coast of Ceylon, Lat. 8° 51′ N, Long 81° 11′ E on a bottom of sand, shells and stones

Family **Temnopleuridae**.

Temnopleurus, Agass.

7. *Temnopleurus toreumaticus*, Klein

A. Agassiz, Revision of the Echini, pp. 463, 464, pl viii^{a}., figs. 4–5.

Of this common species numerous specimens were taken off the Coromandel coast, and at the entrance to Palk Straits in from 5–20 fms.

SALMACIS, Agass.

8 *Salmacis dussumieri*, Agassiz.

A Agassiz, Revision of the Echini, p 473, pl viii^b, figs. 7–8

One small specimen was dredged off the Coromandel coast in 20 fms.

9. *Salmacis sulcata*, Agassiz.

A. Agassiz, Revision of the Echini, p 476; pl viii^b, fig. 3; pl. vi., fig 6

Numerous large specimens were dredged off the Coromandel coast in 5–7 fms, on a sandy bottom

Family **Echinometridae**.

ECHINOMETRA, Rondel

10. *Echinometra lucunter*, Leske

A Agassiz, Revision of the Echini, pp 431–432, pl. iv^b, fig 4, pl. vi, fig 12; pl xxxvi, fig 1

This was found in large numbers among the rocks on the shores of Trincomallie Harbour

STOMOPNEUSTES, Agass.

11. *Stomopneustes variolaris*, Lamarck.

A Agassiz, Revision of the Echini, pp 437–438; pl. iv^b, figs 1–3, &c.

Several specimens of this species were collected on the southern Laccadive Islands, on the reefs of which it is very frequently met with, inhabiting clefts in the coral rock

ECHINOSTREPHUS, A Ag

12. *Echinostrephus molare*, A Agassiz.

A Agassiz, Revision of the Echini, pp 457, 458; pl v^a, figs 10–12, pl vi, fig 20.

One specimen was dredged in the lagoon of the northern Maldive atoll in 20–30 fms

Order CLYPEASTROIDA

Family **Fibularidae**.

FIBULARIA, Lamk.

13. *Fibularia ovulum*, Lamarck

A. Agassiz, Revision of the Echini, pp. 507–509; pl xiii^e, figs 1–3.

Several small specimens were dredged inside the lagoon of the northern Maldive atoll in from 20–30 fms. The largest measured in longitudinal diameter 5 mm.; in transverse diameter 4 mm ; and in height 3 9 mm.

14. *Fibularia volva*, Agassiz.

A. Agassiz, Revision of the Echini, p 509.

A single small specimen, 6 mm. in greatest diameter, was trawled off the Coromandel coast in 23 fms., on a sandy bottom.

Family **Clypeastridae**.

CLYPEASTER, Lamk.

15. *Clypeaster humilis*, Leske.

A. Agassiz, Revision of the Echini, pp 510, 511, pl. xia, figs 1–8.

Very numerous specimens were obtained off the Coromandel, Malabar, and Ceylon coasts in from 10–40 fms

Family **Laganidae**.

LAGANUM, Klein.

16 *Laganum depressum*, Lesson

A. Agassiz, Revision of the Echini, pp 518, 519, pl xiii^{f}, figs 5–8, pl xxxiii., figs 3, 4.

Two small immature specimens were dredged inside the lagoon of the northern Maldive atoll in 20–30 fms.

Family **Scutellidae**.

ECHINODISCUS, Breyn.

17. *Echinodiscus biforis*, A Agassiz

A. Agassiz, Revision of the Echini, pp 532, 533, pl xiii^{b}, figs. 5, 6; pl. xxxvii., figs 4–6

Two specimens—one large, the other small—were dredged off the Coromandel coast in 7 fms., on a sandy bottom.

Order SPATANGOIDA.

Family **Echinoneidae**.

ECHINONEUS, Van Phels

18 *Echinoneus cyclostomus*, Leske

A. Agassiz, Revision of the Echini, p 550, pl xiv, figs 6–8; pl xiv^{a}

On Aukutta (Laccadives) Reef three dead tests of this species were collected, no living specimens were found.

Family **Spatangidae**.

SCHIZASTER, Agass

19 *Schizaster gibberulus*, Agassiz

A. Agassiz, Revision of the Echini, p 612.

A single specimen was trawled off the Coromandel coast in 20 fms.

METALIA, Gray.

20. *Metalia sternalis*, Lamarck

A Agassiz, Revision of the Echini, pp 600–603, pl xxi^{a}, figs. 4, 5; pl xxi^{c}, figs 5–9; pl xxxii, figs. 11, 12, pl. xxxvii., fig 20.

One specimen was trawled off the Coromandel coast in 20 fms.

BRISSOPSIS, Agass.

21. *Brissopsis luzonica*, Gray.

A Agassiz, Revision of the Echini, pp 593, 594, Gray, Cat of the Recent Echinida of the Br Mus, p 49, pl. iv, figs 5, 5 A

Very numerous specimens were trawled off the Coromandel coast in 20 and 33 fms.

22 *Brissopsis Oldhami*, Alcock.

A. Alcock, J A S. B, vol. lxii, pt 2, 1893; pp. 6, 7; pl viii, figs 7, 8

Two perfect and several imperfect specimens of this large and very fragile Echinoid were trawled off Trincomallie in 609 fms, bottom brown mud, bottom temp 44° F.

23 MARETIA, Gray.

Maretia planulata, Gray

A Agassiz, Revision of the Echini, pp 570–572, pl xix^{b}, figs 7–12, &c.

Several specimens were dredged in the lagoon of the northern Maldive atoll in 20–30 fms.

24 *Maretia alta*, A Agassiz.

A. Agassiz, Revision of the Echini, p 569, 'Challenger' Echinoidea, p 172, pl xxxvii, figs 1–4

Many specimens agreeing with the published description in all particulars, except colour, were trawled off the Coromandel coast in from 7–23 fms When taken from the water they are yellow with a faint purplish tinge, but when handled the purple colour becomes more marked and the fingers of the captor are stained light purple. The purple colour is quickly developed by immersion in spirit.

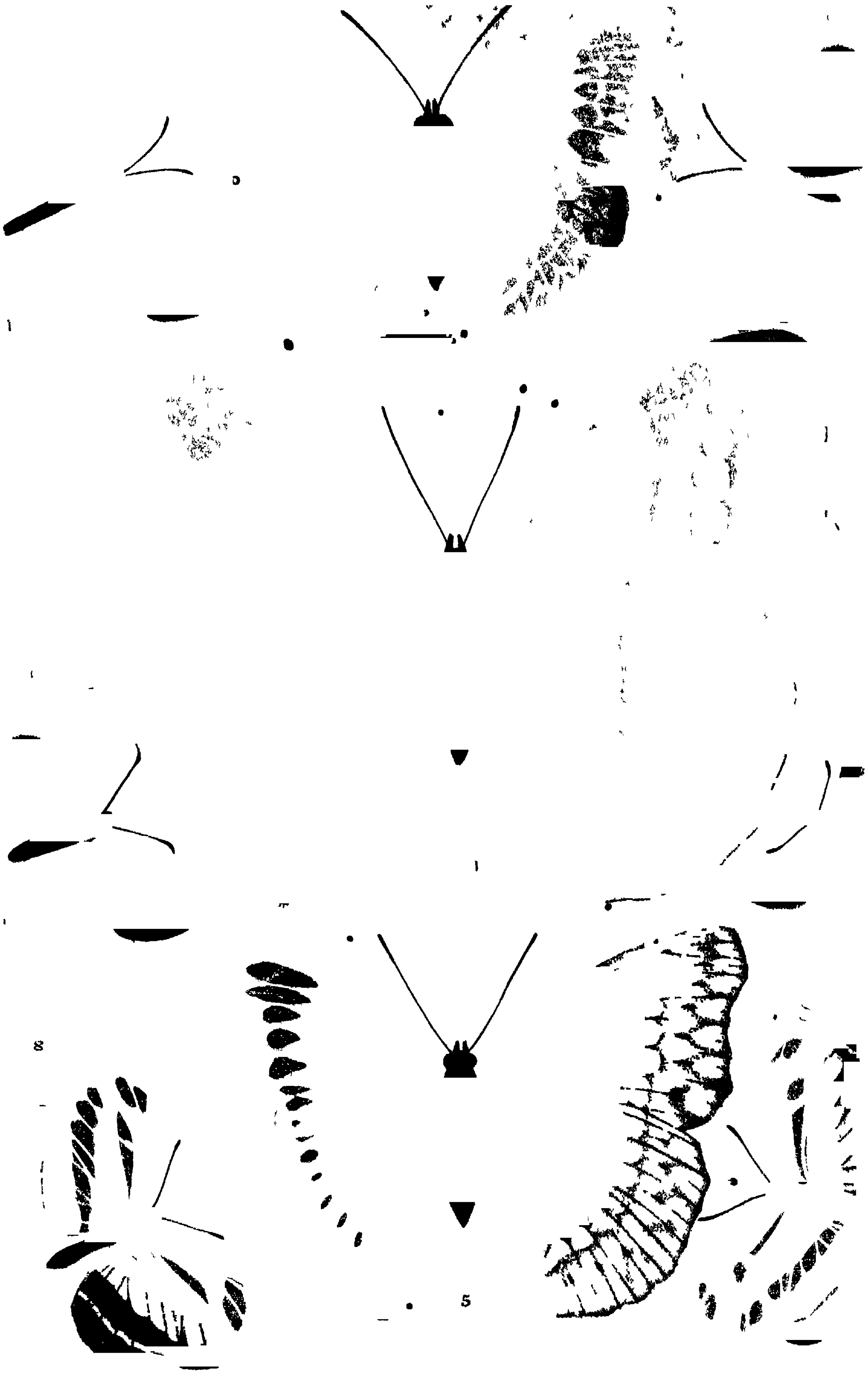
The length of the largest specimen was 37 mm

LOVENIA, Des.

25. *Lovenia elongata*, Gray.

A Agassiz, Revision of the Echini, pp 575–577; pl xix^{c}, figs 1–4

Very many specimens were captured in the lagoon of the northern Maldive atoll, 20–30 fms., off the Coromandel coast, 20 fms, and at the entrance to Palk Straits, 7 fms



B.L.Dos, del

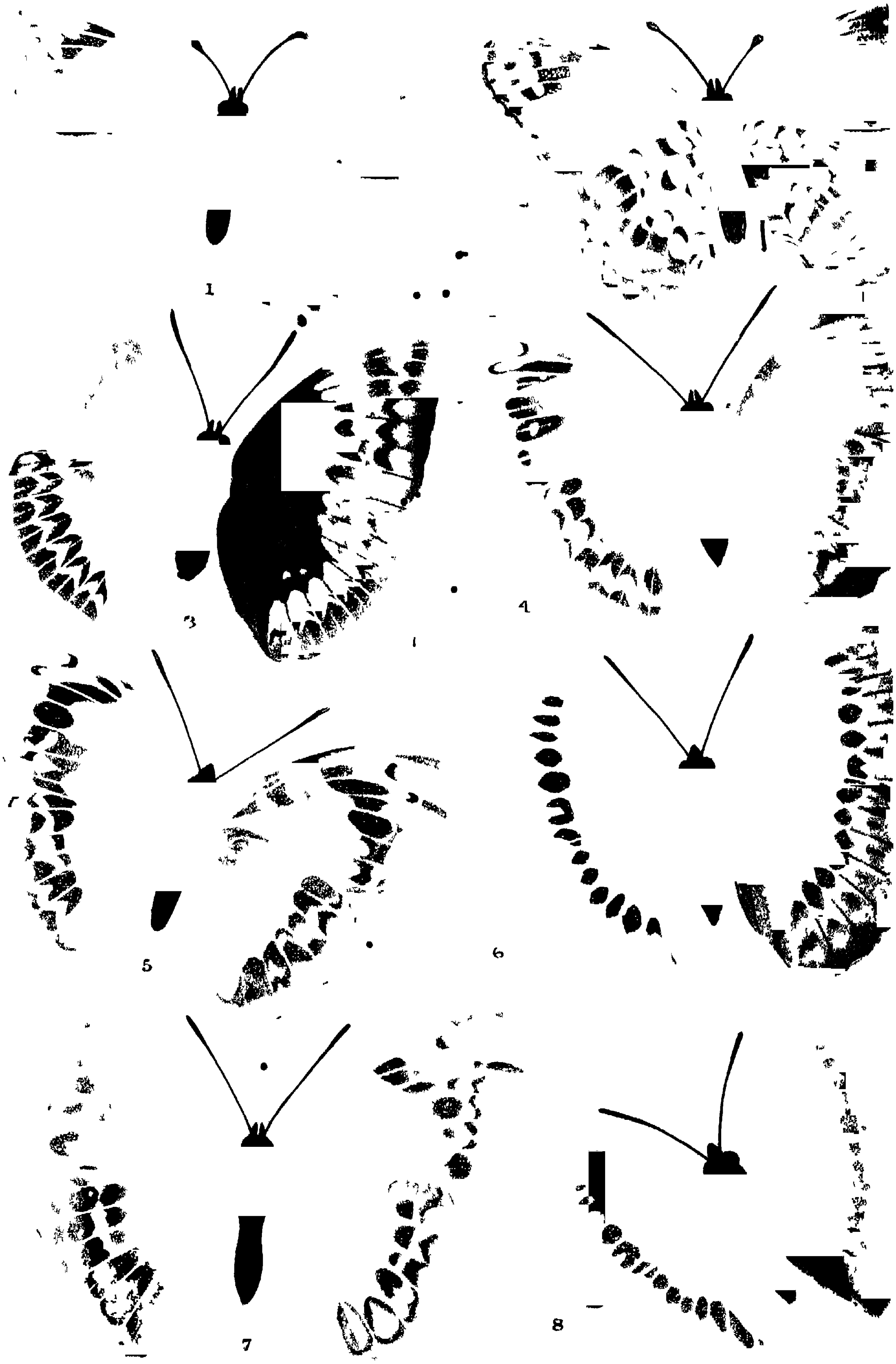
West Nw

INDO-MALAYAN BUTTERFLIES

B. L. Dos del.   West, Newman

INDO-MALAYAN BUTTERFLIES

L. DE NICÉVILLE, Journ. Asiat. Soc. Bengal. 1894 Vol. LXIII.



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West, Newman.

INDO-MALAYAN BUTTERFLIES

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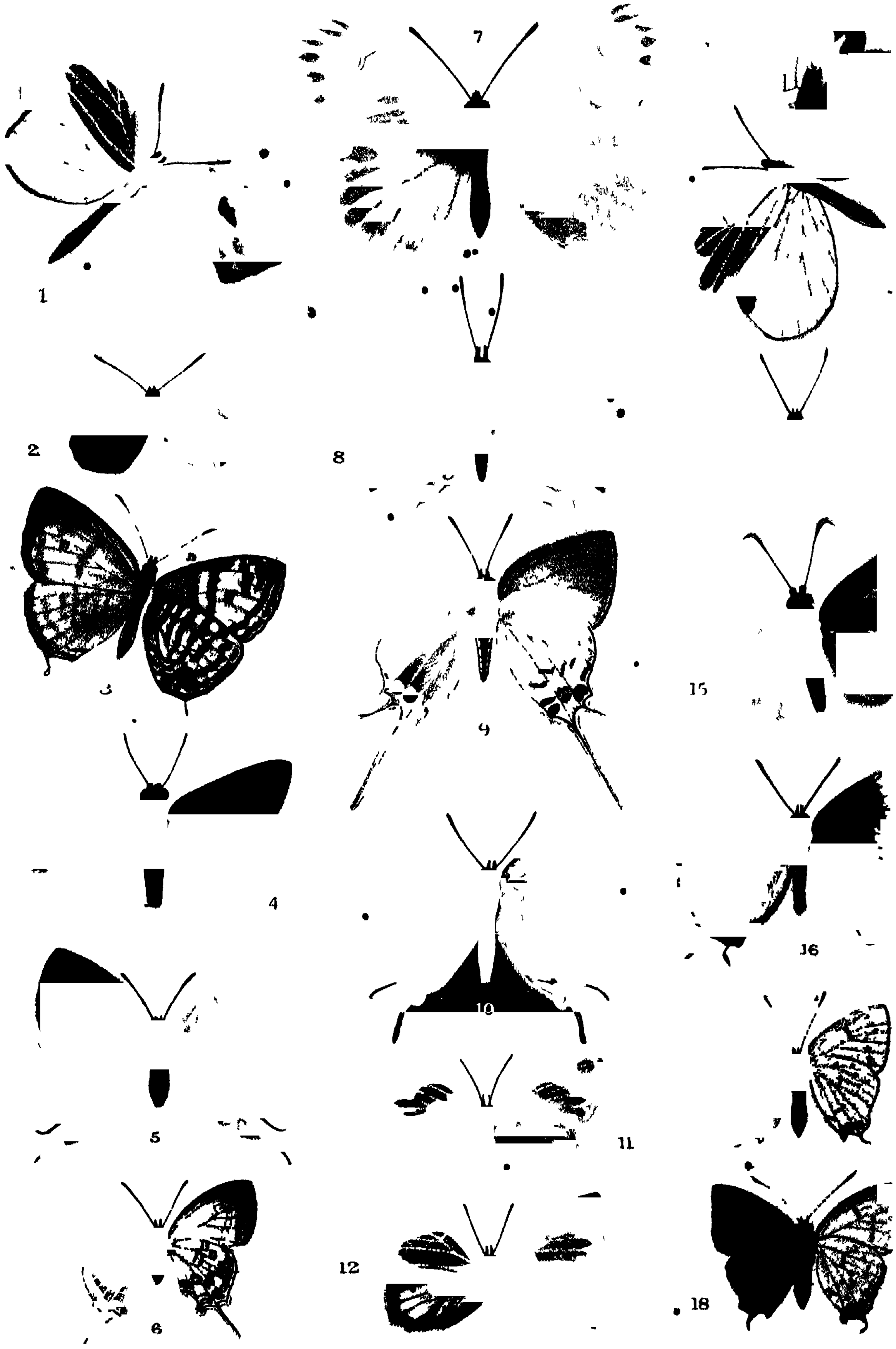
INDO-MALAYAN BUTTERFLIES

L. de NICEVILLE, Journ. Asiat. Soc. Bengal 1894 Vol. LXIII



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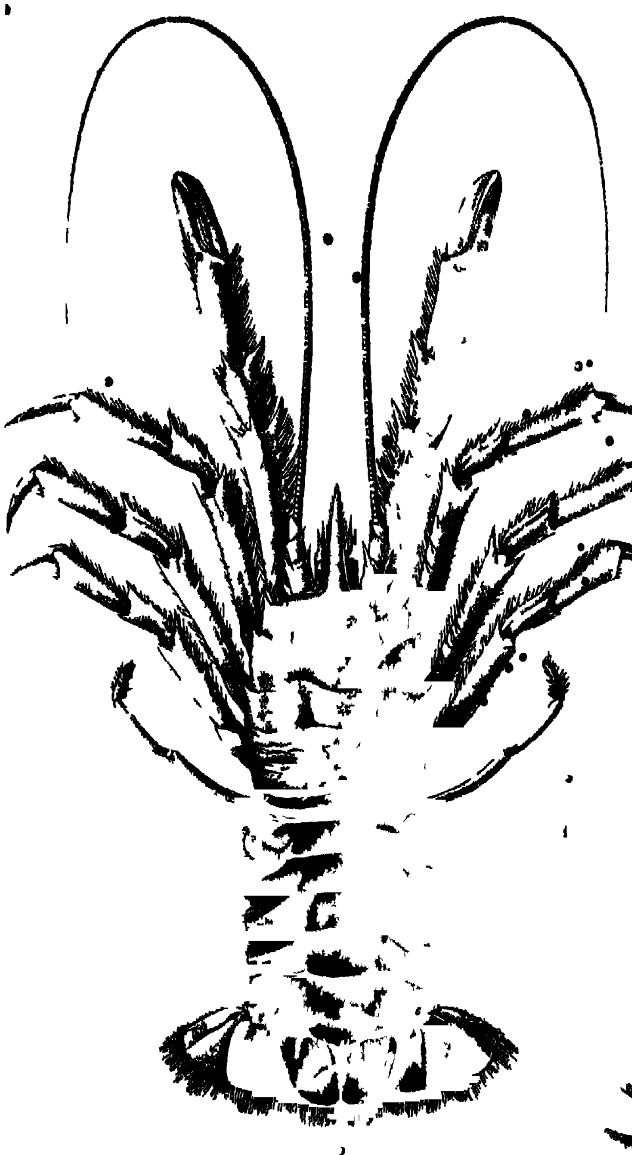
INDO-MALAYAN BUTTERFLIES



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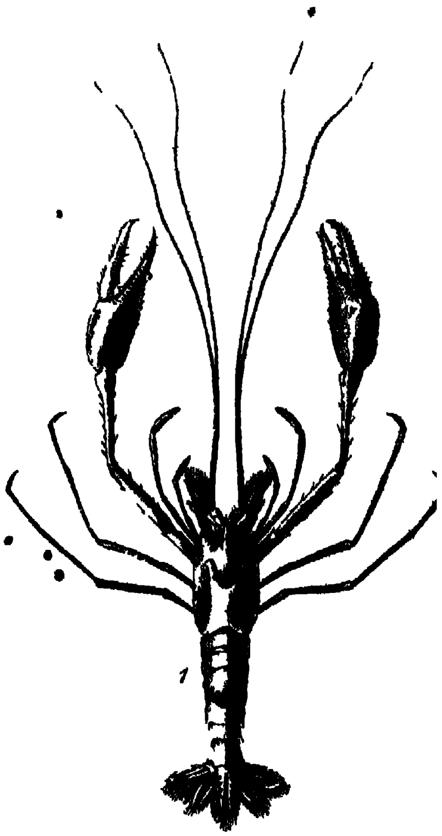

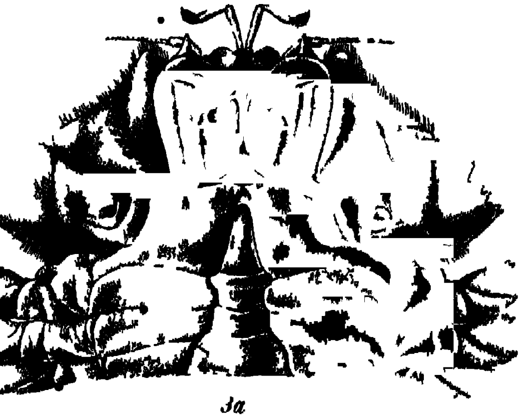

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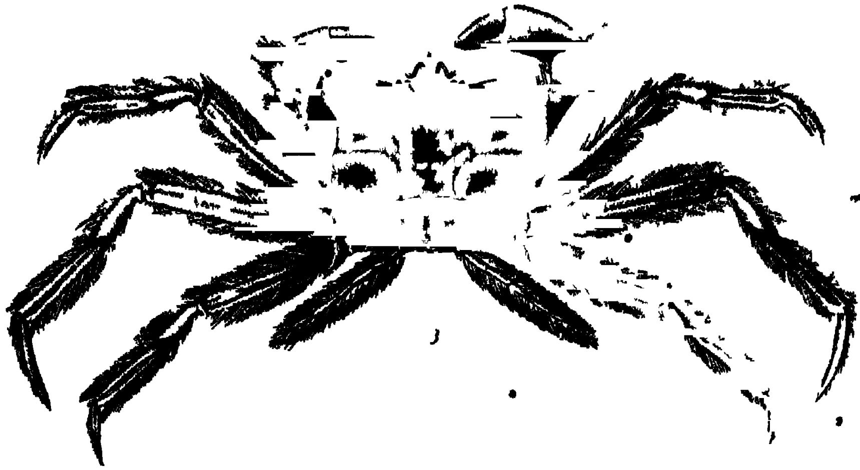

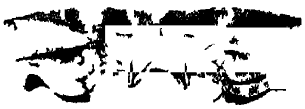

3b

A C Chowdhary & S C Mondul del

S C Mondul

ENGYSTENOPUS BATHYANKYRISTES ARCHÆOPLAX

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Vol. LXIII. Part II.—NATURAL SCIENCE.

No. IV.—1894.

Natural History Notes from H. M. Indian Marine Survey Steamer 'Investigator,' Commander C. F. Oldham, R. N., commanding. Series II, No. 17. *List of the Shore and Shallow-water Brachyura collected during the Season* 1893-1894.[1]—*By* A. ALCOCK, M.B., C.M.Z.S., *Superintendent of the Indian Museum, and* A. R. ANDERSON, B.A., M.B., *Surgeon-Naturalist to the Survey.*

[Received 1st October—Read 7th November.]

1. INTRODUCTION.

Some explanation is due from us for having undertaken, amid much other work, to name the large collection of shore and shallow-water crabs recently made on board the 'Investigator.'

In the first place the collection, though large, is but a small part of the entire collection of *Brachyura* made during many surveying seasons, and it may, therefore, be thought that we should have waited until the whole collection could be taken in hand.

In the second place, it might be doubted whether our opportunities of actually comparing our specimens with types, or with authentically determined specimens of type value, have been sufficient.

To the first objection, we can only reply that our time for joint work is too limited, and too liable to indefinite interruption, to permit a larger undertaking.

The second objection is a serious one, for everyone knows how, even with the most complete literature and illustrations at hand, the most remarkable errors in identification are possible.

Although, thanks to the late Professor Wood-Mason, who for many years aimed at perfecting it, the literature at our call has been as complete as could be desired, yet we have been by no means entirely dependent upon figures and print

We have had for comparison, in the first place, Dr J. Anderson's Mergui collection, named by Dr. deMan , in the second place, a considerable number of authentically named specimens acquired by Professor Wood-Mason from European collections, by exchange , and, thirdly, the specimens named by Professor Wood-Mason himself, which specimens may have been—though we can speak with no certainty on this point—compared by him when in Europe.

Of a total number of 119 species collected, only 6 are described with some confidence as new to science, namely —

1. *Achæus hyalinus*
2. *Inachoides dolichorhynchus*
3. *Arcania quinquespinosa.*
4. *Leucosilia granulosa*
5. *Dorrippe polita*
6. *Cymopolia serripes*

Of the before-known species of our collection 28 do not appear to be mentioned in any of the large collections of *Indian* Crustacea described by previous authors, and may therefore be regarded as new to the Indian fauna These species are :—

1 *Hyastenus gracilirostris*, Miers
2. *Hyastenus tenuicornis*, Pocock
3. *Cryptopodia spatulifrons*, Miers.
4 *Lophozozymus nitidus*, Dana.
5. *Chlorodius lævissimus*, Dana
6 *Chlorodopsis areolatus*, Edw.
7 *Cymo quadrilobatus*, Miers.
8 *Pilumnus cursor*, A M -Edw
9 *Eriphia scabricula*, Dana.
10 *Carupa tenuipes*, Dana.
11 *Lupocyclus orientalis*, Miers.
12 *Lupocyclus rotundatus*, Ad and Wh
13 *Grapsus crinipes*, Dana.
14. *Plagusia clavimana*, Desm
15 *Sesarma obesa*, Dana
16. *Typhlocarcinus nudus*, Stimps.
17 *Typhlocarcinus villosus*, Stimps
18 *Cryptosoma granulosum*, deHaan
19 *Leucosia hæmatosticta*, Ad and Wh.

20. *Leucosia obtusifrons*, deHaan
21. *Arcania laevimana*, Bell
22. *Arcania novem-spinosa*, Ad. and Wh., var. *aspera*, Miers
23. *Phlyxia erosa*, A. M.-Edw
24. *Myra darnleyensis*, Hasw.
25. *Myra elegans*, Bell.
26. *Nursilia dentata*, Bell
27. *Iphiculus spongiosus*, Ad and Wh
28. *Cryptodromia conchifera*, Hasw

2 List of known species

In the following list we have given references only to such species as are rare or new to the Indian fauna, and only such references as we have ourselves verified as aiding the discrimination of the species.

Oxyrhyncha.

1 *Oncinopus neptunus*, Adams and White, North Maldive atoll, 20 fathoms.

2. *Doclea ovis*, Herbst, off Madras coast.

3 *Doclea muricata*, Herbst, Palk straits.

4 *Egeria indica*, Leach, off Madras coast, 20 fathoms

5 *Chlorinoides aculeatus*, Edw, off Madras coast

6 *Hyastenus aries*, Latr, off Madras coast

7 *Hyastenus ?gracilirostris*, Miers, off Madras coast

Described from Fiji, Ann Mag Nat Hist, Vol IV., 1879, p 12

8 *Hyastenus tenuicornis*, Pocock, off Ceylon, 30 fathoms

Described from the China Sea, Ann Mag Nat Hist, Vol. V, 1890, p. 76

9 *Schizophrys spiniger*, Adams and White, off Madras coast

10. *Micippe philyra*, Herbst, North Maldive atoll

11. *Macrocoeloma* sp, off Colombo, 26½ fathoms

12 *Lambrus calappoides*, Adams and White, off Colombo, 26½ fathoms

13. *Lambrus carinatus*, Edw, off Madras coast

14 *Lambrus contrarius*, Herbst, off Colombo, 26½ fathoms.

15 *Lambrus deflexifrons*, Miers, off Ceylon.

Described from Ceylon, Ann. Mag Nat. Hist, Vol IV., 1879, p 21, pl V fig 5

16. *Lambrus echinatus*, Herbst, Palk Straits
17. *Lambrus longimanus*, Leach, off Madras coast.
18 *Lambrus turriger*, Adams and White, off Madras coast
19. *Cryptopodia fornicata*, Fabr., Palk Straits
20. *Cryptopodia spatulifrons*, Miers, var *lævimana*, Miers, Palk Straits

Described from Australia and Borneo, Ann Mag Nat Hist, Vol IV., 1879, pp 26 and 27, pl V, fig 10

CYCLOMETOPA

21 *Carpilius convexus*, Forsk, Laccadives
22 *Carpilius maculatus*, L, Palk Straits
23 *Lophozozymus nitidus*, Dana, Palk Straits

Dana, U S Expl Exp., Pt I, p 166, pl VIII, fig 4*a*, *b*.

24 *Actæa granulata*, Aud, Palk Straits.
25. *Actæa tomentosa*, Edw, Palk Straits
26 *Xantho punctatus*, Edw, Palk Straits
27. *Xanthodes notatus*, Dana, Palk Straits
28. *Xanthodes lamarckii*, Edw, off Madras coast
29 *Zozymus aeneus*, L, Laccadives
30 *Daira perlata*, Herbst, Laccadives
31 *Chlorodius laevissimus*, Dana Palk Straits

Dana, U S. Expl Exp, Pt I, p 215, pl XII, figs 4 *a—g*

32. *Leptodius cavipes*, Dana, Palk Straits
33 *Leptodius exaratus*, Edw, Palk Straits.
34 *Leptodius sanguineus*, Edw Palk Straits
35. *Chlorodopsis areolatus*, Edw. *nec* Ad and Wh, Palk Straits.

For latest synonomy, see Miers, Zoology of H. M S 'Alert,' Crustacea, p 532

36. *Polycremnus octodes*, Herbst, off Madras coast.
37. *Etisus lævimanus*, Rand, Palk Straits Laccadives
38 *Phymodius ungulatus*, Edw., off Madras coast
39 *Cymo quadrilobatus*, Miers, Palk Straits

Zoology of H M. S 'Alert,' p 533.

We agree with Mr. Miers that this species is distinct from *C. andreossii*.

40 *Menippe rumphii*, Fabr, Laccadives.
41. *Actumnus setifer*, DeHaan, Palk Straits.
42. *Pilumnus andersoni*, de Man, Palk Straits.

43. ***Pilumnus ? cursor***, A M.-Edw., Palk Straits

Described in Nouvelles Archives du Museum, Vol IX, 1873, p 244, pl. IX, fig 4, from New Caledonia.

44 *Pilumnus vespertilio*, Fabr, Palk Straits

45 *Trapezia cymodoce*, Herbst, Palk Straits

46 *Trapezia digitalis*, Latr, Palk Straits.

47 *Tetralia glaberrima*, Herbst, N Maldive atoll, 15–30 fathoms.

48. *Quadrella coronata*, Dana, off Ceylon, 28 fathoms

49. *Eriphia lævimana*, Latr., Laccadives

50 *Eriphia scabricula*, Dana, Palk Straits

Dana, U S Expl Exp, Crustacea, Part I, p 247, pl XIV, figs 5*a*–*b* For distribution see Miers, Zoology H M S 'Alert,' pp. 535 and 572

51 *Achelous granulatus*, Edw, off Colombo, 26½ fathoms

52 *Achelous whitei*, A M.-Edw, Palk Straits.

53 *Neptunus hastatoides*, Fabr, Palk Straits Madras coast

54 *Neptunus sanguinolentus*, Herbst, off Madras coast

55 *Neptunus tuberculosus*, A M.-Edw, Palk Straits

56 *Xiphonectes longispinosus*, Dana, N. Maldive atoll, 15–30 fathoms

57 *Thalamita admete*, Herbst, Palk Straits

58 *Thalamita prymna*, Herbst, Palk Straits

59 *Thalamita savignyi*, A M.-Edw, Maldives. Palk Straits

60 *Goniosoma luciferum*, Fabr, deMan, Madras coast

61 *Goniosoma truncatum*, Fabr, deH, Palk Straits

62 *Goniosoma variegatum*, Fabr., var *callianassa*, Herbst, Palk Straits.

63 *Carupa tenuipes*, Dana, off Madras coast

Dana, U. S Expl Exp. Crustacea Pt. I, p 279, pl XVII, figs 4*a*–*e*, and A Milne-Edwards, Archiv. du Mus, Vol. X, p. 386, and Nouv Archiv du Mus, Vol IX, 1873, p. 171.

64. *Lupocyclus orientalis*, Miers, off Madras coast, 33 fathoms

Described from deep water, off Ki Islands and Admiralty Islands, 'Challenger' Brachyura, p 186, pl XVII, fig 1

65. *Lupocyclus rotundatus*, Adams and White, off Madras coast.

Adams and White, Voyage of H. M. S. 'Samarang,' Crustacea, p 47, pl XII., fig. 4 Borneo.

Our single specimen only differs from the above in one unimportant particular, namely, that instead of five spines on the anterior edge of the meropodite of the cheliped, as described by Adams and White, *loc cit*, and by deMan (Notes Leyden Museum, Vol V, 1883, p 153), there are seven A Milne-Edwards, however (Archiv du Mus, Vol X, 1861, p 388), says "*environ cinq épines*," which would appear to show that the number is variable

CATOMETOPA

66 *Cardisoma carnifex*, Herbst, Pulicat, Madras coast.

67 *Ocypoda ceratophthalma*, Pall., Laccadives Madras coast

68 *Ocypoda cordimana*, Latr, Trincomallee Madras coast

69. *Ocypoda macrocera*, Edw., Ceylon coast Madras coast

70 *Ocypoda platytarsis*, Edw, Ceylon coast.

71. *Gelasimus annulipes*, Latr, Pulicat, Madras coast.

72 *Metopograpsus messor*, Forsk, Palk Straits.

73 *Grapsus crinipes*, Dana, Laccadives

Dana, U S Expl Exp, Crustacea, pt i, p 341., pl. XXI., figs. 6 *a–d*

74. *Grapsus pictus*, Latr, Laccadives Ceylon

75 *Grapsus strigosus*, Herbst, Trincomallee

76 *Plagusia clavimana*, Desm, Madras coast

Milne-Edwards, Hist, Nat, Crust, tom. II, p 92, and Cuvier, Règne Animal, Crustacés, pl 23, fig 3.

77 *Plagusia depressa*, Herbst, Madras coast

78 *Plagusia squamosa*, Lam, Palk Straits

79 *Varuna litterata*, Fabr., Madras coast

80. *Sesarma tetragona*, Fabr, Pulicat

81 *Sesarma quadrata*, Fabr, Madras coast.

82 *Sesarma ? obesa*, Dana, Minnikoy

Dana, U S. Expl, Exp, Crustacea, pt I, p. 356, pl XXII., figs 10a–c Str. of Balabac.

83 *Carcinoplax* sp. Madras coast

84. *Notonyx* sp. Madras coast

85 *Typhlocarcinus nudus*, Stimpson, Palk Straits.

Stimpson, Proc Ac Nat Sci Philad, 1858, p 96, from Hong-kong

86. *Typhlocarcinus villosus*, Stimpson, Palk Straits

Stimpson, Proc. Ac. Nat. Sci. Philad., 1858, p 96, from Hong-kong Miers, Proc Zool. Soc., 1879, p 40, from Corean and Japanese Seas

Walker, Journ Linn Soc Zool., Vol XX, 1890, pl IX, figs 6–8, from Singapore

OXYSTOMATA

87. *Calappa hepatica*, L, Laccadives Maldives Ceylon

88 *Calappa lophos*, Herbst, off Madras coast.

89 *Cryptosoma granulosum*, deH, N Maldive atoll

deHaan, Fauna Japonica, Crustacea, p 71, pl XIX, fig 3

90 *Mursia bicristimana*, nob, Madras coast, 33 fathoms

Vide Journ Asiatic Soc Bengal, pt 2, 1894, p 179

The male differs from the female, (1) in its smaller size, (2) in its narrower rostrum, and (3) in its more closely and sharply granular integument

91 *Matuta victrix*, Fabr, off Madras coast

92 *Leucosia hæmatosticta*, Adams and White, off Madras coast

Adams and White, Voyage, H M S 'Samarang,' Crustacea, p 54, pl XII, fig 2 "Eastern Seas" Also Walker, J L S, Zool, Vol XX, 1890, p. 111, from Singapore Miers, P Z S, 1879, p 40 from Corean and Japanese Seas Stimpson, Proc Ac Nat Sci Philad, 1858, p 160, from Japan

93. *Leucosia obtusifrons*, deH, off Madras coast

deHaan, Fauna Japonica, Crustacea, p 133, pl XXXIII, fig 2

94. *Leucosia ornata*, Miers, off Trincomallee, 28 fathoms

Miers, Trans Lin Soc, Zool, (ii) Vol I, p 236, pl, XXXVIII, figs 7-9, from Ceylon Dr deMan, however, J L S., Zool, Vol XXII, 1888, p 197, regards this species only as a variety of *L urania*, Herbst.

95 *Leucosia rhomboidalis*, deH, off Madras coast.

deHaan, Fauna Japonica, Crustacea, p 134, pl XXXIII, fig 5 Already reported from Trincomallee, by F Muller, Verh Naturf, Ges Basel, Band 8, 1890, p. 472.

96. *Leucosia urania*, Herbst, off Trincomallee, 28 fathoms

97 *Arcania lævimana*, Bell, Maldives

Bell, Trans. Linn Soc, Zool, Vol XXI, 1855, p 310, pl XXXIV, fig 10, from Philippines Also A Milne-Edwards, Nouv Archiv du Mus, Vol X, 1874, p 48, pl III, fig 4, from New Caledonia

98 *Arcania novemspinosa*, Adams and White, var. *aspera*, Miers, off Madras coast

Miers, Ann Mag Nat Hist, Vol V, 1880, p 317 "Malaysia"

99 *Ixa cylindrus*, Fabr Palk Straits. Off Madras coast.

100 *Phlyxia erosa*, A. M -Edw., Maldive atoll.

A Milne-Edwards, Nouv. Archiv du Mus, Vol X, 1874, p 47, pl III, fig 2, from New Caledonia

Also Miers, P. Z S, 1884, p 13, from Mauritius, and from Fiji and Haswell, Cat Australian Crustacea, p 125

101. *Myra australis*, Haswell, off Madras coast.

102 *Myra darnleyensis*, Haswell, Maldives Off Madras coast

Haswell, Proc. Linn Soc. N S Wales, Vol IV., 1879, p. 52, pl. V., fig 4 Australia

103. *Myra elegans*, Bell, off Madras coast

Bell, Trans Linn Soc., Zool., Vol. XXI, 1855, p 297, pl XXXII., fig 4 "In mari orientali."

104 *Myra fugax*, Fabr, off Madras coast

105 *Pseudophilyra melita*, deMan, off Madras coast.

The granulation of the hand and upper surface of the carapace appears to be a secondary sexual character confined to males of large size.

106 *Nursea plicata*, Herbst, off Madras coast

107 *Nursilia dentata*, Bell, Maldives Off Madras coast

Bell, Trans Linn Soc, Zool, Vol XXI, 1855, p 309, pl XXXIV, fig 6 "In oceano Indico" Also Stimpson, Proc Ac Nat Sci Philad, 1858, p 161, from E Pacific Ocean Haswell, Proc Linn Soc, N S. Wales, Vol IV, 1879, pp 56 and 104, from Australian Region Miers Zoology, H M. S, 'Alert,' Crustacea, pp 253 and 548, from Australia Arafura Sea, Fiji, Seychelles Pocock, Ann Mag Nat. Hist, Vol. V, 1890, p 73, from China Sea, 40 fathoms

108 *Iphiculus spongiosus*, Adams and White, off Madras coast

Adams and White, Voyage H M S. 'Samarang,' Crustacea, p. 57 Philippines Also Stimpson, Proc Ac Nat Sci Philad, 1858, p 161, from Hong kong Miers, Zoology H M S 'Alert,' Crustacea, p 253, from the Arafura Sea, 32–36 fms

109 *Dorippe quadridens*, Fabr, off Madras coast.

110. *Dorippe sima*, Edw, Palk Straits

111 *Cymopolia jukesii*, White, N. Maldive atoll.

We place this species here, though we share Mr Miers' doubt ('Challenger,' Brachyura, p 334) as to its having any very near connexion with the *Dorippidæ* We think that it is probably a Catometope, and that it should be placed near the *Gonoplacidæ*, as delimited by Dana.

ANOMALA.

112 *Cryptodromia ?conchifera*, Haswell, off Madras coast.

Haswell, Cat Australian Crustacea, p 141, pl. III, fig 4

113 *Raninoides serratifrons*, Henderson, off Trincomallee, 28 fathoms.

Henderson, Trans Lin Soc, Zool, 1893, p 408, pl XXXVIII, figs. 10–12

3 DESCRIPTIONS OF NEW SPECIES.

OXYRHYNCHA

ACHÆUS, Leach, Miers

114 *Achæus hyalinus*, n sp.

Carapace subtriangular, thin, vitreous, spiny, the regions fairly well defined, the postorbital region constricted.

The spiny rostrum, as seen from above, ends in two short spines,* each of which is bifid from the base, but, as seen from below, these spines do not form the end of the rostrum, which is now seen to consist of a strong vertically deflexed spine united by a flying bridge to the interantennulary septum

The inflated gastric and branchial regions, as well as the hepatic regions and the antero-lateral border of the carapace, are coarsely, sharply, and rather distantly spiny, most of the spines being capped with a tuft of short hairs

The eyes are movable but not retractile, and the eye-peduncle has a tubercle in the middle of its anterior surface

All the ambulatory legs are hairy throughout, the hairs of those of the 2nd and 3rd pairs being remarkably long, close-set, even and stiff The arm, wrist, and hand of the chelipeds are acutely spiny, as are also the edges of the meropodites of the 2nd–5th legs, the spines on the front edge of the meropodites of the 2nd and 3rd pairs being particularly large and conspicuous

The 5th pair of legs is subcheliform, the propodite being remarkably dilated at its base to receive the tip of the claw-like dactylus the dactylus is minutely spinate, but the expanded base of the propodite is furnished with a comb of sharp spines.

Length of carapace 14 millim., breadth of carapace 9 millim. greatest span 67 millim

Off Trincomallee, 28 fathoms

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* These spines are very short and divergent, and are nothing like those of *Stenothynchus*

INACHOIDES, Edw. and Lucas.

Milne-Edwards and Lucas, in D'Orbigny, Voy. dans l'Amer. merid., Crustacés, pp 4-5

Miers, Journ Linn Soc, Zool, vol XIV, 1879, p 646.

A. Milne Edwards, Miss Sci. au Mexique etc, I, Crustacés etc, p. 198.

115. *Inachoides dolichorhynchus*, n sp

Distinguished by its rostrum, which is equal in length to the rest of the carapace

Excepting the rostrum, the form of the body is very similar to that of the type species (Milne-Edwards and Lucas, *op cit*, pl. iv., fig 2)

The long curved simple rostrum, and the carapace, are spiny the regions of the carapace are well delimited the supra-ocular and post-ocular spines, though small, are distinct. In addition to spinules there are numerous larger spines—four on the gastric region, a bicuspid one on the cardiac region, one on the intestinal, and about four on each branchial

The eyes are retractile towards the sides of the carapace, but are in all positions *completely* exposed

The chelipeds are about one-fourth longer than the carapace rostrum included, their palm, which is about two-fifths of their total extent and nearly three times the length of the fingers, is broadened and moderately inflated

The other legs in form and proportion resemble those of the type (Edw and Lucas, *op cit.*, pl iv, fig 2)

Total length of carapace, 17 5 millim, greatest breadth of carapace, 8 millim, greatest span 54 millim

Off Madras coast, shallow-water

The genus *Inachoides* though recorded from Viti, by M. A. Milne-Edwards (Journ. Mus. Godeffroy, vol i, 1873-74, p 253), does not appear to have been before observed in Indian waters

OXYSTOMATA

ARCANIA, Leach, Miers

116 *Arcania quinquespinosa*, n sp.

Only differs from the well-known *Arcania septemspinosa* (which, though not contained in the present collection, is very common in shallow water off the Madras coast) in the following particulars —

(1) the great spines of the carapace are relatively smaller, and

the spine on the posterior part of the branchial region—on either side of the intestinal region—is altogether wanting,

(2) the lobes of the rostrum are longer and more acute,

(3) the fingers, instead of being equal in length to the palm, are nearly twice the length of the palm,

(4) the small cardiac region is of a bright-red colour, edged with white, and this can be seen fairly well even after prolonged immersion in strong spirit

In all other respects this species exactly resembles *Arcania septemspinosa*, Fabr.

Off Madras coast, up to 13 fathoms

LEUCOSILIA, Bell

117. *Leucosilia granulosa*, n. sp

Carapace slightly broader than long, subglobose truncated anteriorly, so that the external maxillipeds are visible beyond the front very closely covered, as are also the chelipeds, with bead-like granulations the regions delimited by shallow yet distinct furrows. The rostrum consists of two divergent hollow lobes, beneath which the antennules are lodged · immediately behind the rostrum the carapace is traversed from side to side by a deep groove The antero-lateral margin is interrupted by a deep notch, in front of which is a coarse blunt hepatic tooth, while behind it is a stronger epibranchial tooth. The lateral angle is also marked by a prominent granule. The posterior margin is almost straight and bears three tubercles, of which the median is hardly conspicuous. The hepatic regions are inflated, as are also the sides of the gastric region The intestinal region forms a tumid boss, on the summit of which the granulations are obsolescent.

The tips of both rami of the external maxillipeds are strongly bent upwards, that of the exognath ending in a large blister-like tubercle The spine on the penultimate abdominal segment of the male is a mere tumescence

A male and an egg-laden female from the North Maldive atoll, 15–30 fathoms

	Male.	Female
Length of carapace...	6 5 millim	7·5 millim
Breadth of carapace	7 0 millim.	9 0 millim.
Greatest span (of chelipeds)... ..	24 0 millim	26 5 millim

Besides being smaller, and having the chelipeds of slightly greater relative length, the male differs from the female in being much more sharply granular

DORIPPE, Fabr, Edw

118 *Dorippe polita*, n. sp.

Apparently nearest to *Dorippe sexdentata*, Stimpson, Proc Acad Sci. Philad., 1858, p 163, from South Japan

Distinguished by the smooth, hard, naked, and polished integument of the body and limbs

Carapace smooth and polished, slightly broader than long, with the regions hardly defined

Front divided into four small lobes, of which the two median, though slightly the smaller, are slightly the more prominent, and also arise on a lower level.

The external orbital angles are a little more prominent than the front Infra-orbital tooth blunt, small, and inconspicuous

The lateral borders of the carapace are faintly notched near the middle, being sharp, almost straight, and convergent in front of the notch, and a little inflated behind it

The sterna between the chelæ are remarkably tumid

The eye-stalks are long, slender, and much curved

The legs are perfectly smooth, and, except for some scanty hairs on the chelipeds, are naked the last four pairs are flat, and the last two pairs typically subchelate The pleuræ, or plates beneath which the fifth pair of legs arise, are remarkably large

Length of carapace, about 11 5 millim., greatest breadth of carapace about 12 millim, greatest span (3rd pair of legs) 61 millim

A single egg-laden female from off the Madras coast, 7 fathoms

In many respects this species resembles *Ethusa* much more closely than *Dorippe*, but the disposition of the afferent branchial opening proves it to be a true *Dorippe*.

? CATOMETOPA

CYMOPOLIA, Roux, Edw.

119 *Cymopolia serripes*, n sp

This species is characterized by the broadly expanded lamellar (natatory) propodites and dactyli of the third and fourth pairs of legs, and by the sharp serration of the posterior edges of those joints

The carapace is of the usual form, with the regions plainly delimited, and the surface very crisply granular. The front is four-lobed, the outer lobe on either side being inconspicuous and recurved upwards at tip, the two middle lobes being conspicuous and deflexed. The supra-orbital margin is serrated and folded much as in *C caronii*.

The antero-lateral margins have, exclusive of the large external orbital tooth, four sharp teeth, which increase in size from behind forwards

The sinuous postero-lateral margins are quite smoothly moulded.

The posterior margin is surmounted by a festoon of eight even teeth, much as in *O caronii*, below it the last—and only the last—sternal segment is produced to form a remarkably sharp and salient crest, much more salient than that, for example, of *O. caronii*

The trunk-legs of the second pair are not longer, and, except in their meropodite, hardly stouter than those of the fifth pair: their propodite is sharply and finely serrated along its posterior border, and their claw-like dactylus has at its base, on the same border, two sharp teeth

The trunk-legs of the third and fourth pair resemble each other in form and size, their length being about one-fifth more than the greatest breadth of the carapace their prismatic meropodites are short, inflated, and considerably more than half as broad as long, with the edges sharply denticulate, and with the upper surface crisply granular their carpopodites, though distinctly prismatic, with all the edges sharply delimited, are much depressed, and have the anterior, posterior, and distal borders all sharply denticulate their propodites and dactyli are broadly lamellar and distinctly natatory, the swimming surface being increased by a thick fringe of very long setæ on the anterior border. both these joints are longitudinally ribbed and fluted, and both have the posterior border sharply serrated

The legs of the fifth pair are filiform their length is about two-thirds the greatest breadth of the carapace they are finely granular above, and their dactylus is as long as their propodus

Colours in spirit, mottled shades of white and purplish brown, with broad cross-bands on the propodites and dactyli of the third and fourth pairs of legs

Length of carapace 9 5 millim, breadth of carapace 11 millim greatest span (fourth pair of legs) 37 millim

Off Madras coast, shallow water

Postscript We take the present opportunity of noticing an omission in the Plate (Plate IX) illustrating *Archæoplax notopus*, nob [*] A figure of the external maxillipeds has been inadvertently left out

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[*] J A S B, Part ii, No 3, 1894, pp 181–183, Plate ix

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No. I.—1894.

The Nasal Index Compared upon the Head and Skull—With Notes upon the Nasal Bones, and Anterior Nasal Aperture

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(With Plates I, II, & III)

[Read 7th Feb]

Anthropology at present is like a puzzle of which the pieces have not been all found, or put together Some searchers bring parts that fill large gaps. Others from their labours produce but little pieces, which to many may appear foreign to the work in progress, but to some these small contributions are the parts which frequently supply the deficiencies left between the larger and more important discoveries. It is possible too at times that a piece of this puzzle may be ill-placed, so that deductions drawn from it, owing to the malposition, would be based on a wrong foundation, and might thus lead to improper weight being given to its importance absolutely and relatively

I hope that the facts presented in this paper, although in some ways casting doubt on beautiful hypotheses, may in other ways lead to a further reconsideration of the value given to one of the axiomatic pieces of the anthropological puzzle—the nasal index—and draw attention to the fact that the nasal index on the head is one thing, and the nasal index of the skull another, and that they are not comparable with each other.

In a contribution of mine to the Journal of Anatomy and Physiology (Vol. XXVII), at page 20, while comparing the measurements of the heads of live Chuhras from Mr. Risley's tables (Tribes and Castes of Bengal) with the results obtained by myself on the skulls of men of the same caste, I was struck with certain discrepancies between the data. I then remarked—"A comparison of craniometrical measurements on the live subject with those carried out on the macerated skull will not be without interest. In both instances the caste was alike. The chief discrepancy is in the nasal measurements—especially the transverse. The breadth taken at the widest portions of the alae, does not seem to correspond to the greatest transverse diameter of the anterior nares measured on the skull. There is a greater similarity in the vertical measurements of the nose. It will be noted, though, that, contrary to expectation, the height is greater on the skull than on the live subject. I do not attempt to explain this. I am not aware whether M. Broca, in his discovery that the nasal index is one of the best for the purpose of distinguishing the various races of mankind, would expect his observations on a particular tribe, taken on the live subject, to correspond to observations taken on the *skulls* of members of the same tribe."

With the object of explaining the disagreement noted above, I made the investigations embodied in this paper. They were conducted as follows:—Having carefully measured, with sliding compasses, the nasal diameters of 62 "subjects," I removed the integuments, &c., and having cleared the naso-frontal suture and anterior nasal aperture, I again took the diameters. Tabulating the results I computed the indices and instituted a comparison between the measurements taken on the head with those carried out on the skull of each and every one of the bodies. Of these bodies, 54 were males, and 8 females. They were of different castes or tribes—low caste Hindu, Hindu Khatri, Musalmán, Rajput, Afiidi, Pathan, Jat, Seyid, "Panjabi Musalman," and Chuhra.

It is to be noted that the term "Panjabi Musalman" is not the name of a *caste* in the proper ethnic acceptation of the word. There is, however, none better for the present. I should say that the Panjabi Musalmáns are conglomerate—to borrow a geological term—and amongst them are to be found types varying from that of the Chuhra to the highest Rajput.

Before bringing forward the explanation of why the nasal index taken on the skull does not correspond to that taken upon the head, I will note certain points bearing on the anterior nasal aperture, the nasal bones, and that portion of the great transverse suture with which these articulate—the nasal notch.

THE NASAL BONES are thickest at the upper extremity, narrowest at the upper third, becoming wider and thinner as they pass down This fan-shape held good in 106 skulls. In 12 specimens the bones were more or less rectangular The profile view varies In 6 skulls it was a straight line from nasion to inferior border as shown in Fig 1, Pl I In these there is no curve, and hence no fundus, and the "root of nose" on the skin will correspond to the fronto-nasal articulation In 27 skulls the anterior surface is concave in its whole extent as is shown in Fig 2, Pl I In 96 skulls the profile shows a curve above, and a convexity below Fig 3, Pl I, brings this out very well The upper part of the fundus of the curve on the bone corresponds roughly to the "root of the nose" upon the skin The extent of the bone from this point up to the nasion is about 4 μ

In the first division the fronto-nasal sulcus is scarcely noticeable, whilst in most of the second class it is very deep—a deep fronto-nasal sulcus corresponds to largely developed frontal sinuses and strongly curved nasal bones

I have noticed that in the higher castes the extent of the nasal bones above the fundus of the curve is greater than the same amongst the lower races, so that, in the former, the height of the nose, taken on the undissected *head*, will be much less than the long diameter of the nose measured on the *skull* of the same head—thus —

Head of Afridi Pathan Height of Nose $=52\mu$

Skull of same „ „ Long Diameter Nose $=59\mu$ —difference in favour of skull $=7\mu$ That is, the extent of the nasal bones above what corresponds to the "root" of the nose in the man was 7μ

In 30 male Panjabi Musalmáns—cultivator class—comparing the diameters in the same way the average is a difference of 4μ.

In the 4 male Chuhras the observations showed only 1 μ of difference *The higher the caste, the greater the discrepancy.*

This brings me to the consideration of the NASAL NOTCH of the frontal Its depth varies according to the upward development of the nasal bones The shallower the notch of course the lower the level of the nasion In cases where the "notch," as such, is practically absent, the thin plate of bone below the glabella will be prolonged down straight, instead of retreating to join the naso-frontal suture, and in measuring upon the live subject the compasses would be placed on the head somewhere above the level of the nasion, the frontal bone thus exceptionally entering into the formation of the "root" of the nose The "root" being thus *on* the frontal, and not on a level with its *hypothetical position*, the nasion, or its *usual site*, above the fundus of the nasal curve Under such circumstances the nasal processes of the superior maxilla are on a slightly higher level than the upper borders of the nasal bones (Pl III, A). This is very rare, and is only present in 3 skulls in my collection Fig. 4, Pl. I., shows this peculiarity, which cannot be discovered till after the integuments, &c, have been dissected from the skull

A less rare condition (Pl. III., B—present in 18 of my skulls) is for the nasal processes of the superior maxillæ to be on an equality with the upper border of the nasal bones, Fig 5, Pl I, is of one of these skulls The foregoing explains how it happens that in Nos 20, 38, 41, and 47 the height of the nose on the head is greater than the long diameter of the nose on the skull, as well as No 13, where the long diameters on head and skull are equal.

The ordinary condition (Pl III, C) of the nasal notch of the frontal bone is that represented in Fig 6, Pl I, where it is deep, and the nasal bones extend considerably above the level of the nasal processes of the superior maxillae In this, the common variety, the extent of the nasal bones above the fundus of the curve is about 4 μ, as I have before shown, and in measuring the length of nose on the head, the compasses will not be placed on the nasion, but about 4 μ below it, which point will be the visible "root" of the nose, and so it happens that one may formulate a rule to which there will only be the exceptions noted *The height of the nose on the head of an individual will be less than the long diameter of the nose on the skull of the same person, and generally the difference will be about 4 μ in the higher races, but will probably be less in the lower castes.*

ANTERIOR NASAL APERTURE. This varies considerably in the size, shape, and condition of its inferior margin I have noted two main types—the CORDIFORM and ROTUND. Of the former there are three varieties—*Regular*, *Lyrate*, and *Irregular* To these I think most variations can be referred Figs 7, 8, 9, 10, Pl II, faithfully display the modifications in question

In the *Regular* CORDIFORM *Nasal Aperture* (Pl II, Fig 7) the nasal bones bounding it above show scarcely any pre-nasal notch—the lateral nasal spine is long, and gradually tapers down to the *apertura pyriformis* of the superior maxilla. The median nasal spine is not prolonged down as in the "lyrate cordiform" In about 20 °/$_0$ it is unsymmetrical—one side being at a lower level than the other In some 36 °/$_0$ the lower margin is rounded or bevelled off to the alveolar surface as in the skull of the negro or orang—Fig 11, Pl. II, and Fig. 13, Pl III.

The *Lyrate* CORDIFORM (Pl II, Fig 9.) differs from the foregoing, chiefly as to the great depth of the pre-nasal notch and consequent large development of its boundaries—the lateral and median nasal spines. This is commoner than the "regular cordiform" of photo No. 7 The rounding off on the lower margin occurs in as large a percentage of this as of the former class

The *Irregular* CORDIFORM as shown in Pl II, Fig 10, has no pre-nasal notch, The median nasal spine being practically obsolete This formation of the anterior nasal aperture exists in 6 °/₀ of the skulls in my collection In none of these is there any bevelling off to the alveolar surface—the sharp nasal margin of the superior maxillæ being well marked. The opening may be unsymmetrical as shown in Pl. II., Fig 12

The ROTUND type is somewhat rare amongst Panjáb skulls, and those in which it is present are of low caste and inferior development. See Fig 8, Pl II. The aperture is rounded, and in every instance the nasal margin of the maxillae is bevelled, and slopes to the alveolar surface. The anterior nasal spine is very small, almost absent. The floor of the nasal fossae is on a higher level than the nasal margin of the pyriform aperture. For comparison as to the prognathism and shape of lower border of the anterior nares in some of the foregoing, the accompanying photograph (Pl III, Fig 14.) of a young gorilla's skull, may be interesting

The transverse diameter of the anterior nasal aperture taken on the skull, is less than the breadth of the nose taken on the head of the same subject The difference is usually 7 μ, and in the lower castes it may be 9 μ, as in these the difference is greatest. Also, other things being equal, the older the individual the greater is the difference between the nose breadth and the transverse diameter of the anterior nasal aperture, and the younger the person (skull of 20 years or under) the less will these two measurements disagree.

This shows that the nose becomes coarser with the growth of the lower lateral cartilages as the type develops In no instance were these two measurements on head and skull found to be equal.

NASAL INDEX Now. to consider an important point as regards the nasal index I have shown—

1 That the long diameter of the nose on the skull is greater than the height of the nose on same head, and now also,

2 That the transverse diameter of the anterior nares of the skull is less than the breadth of the Nose on the same head, or, that the long diameter is greater on the *skull*, the breadth greater on the *head.*

Owing to this, the nasal index deduced from observations on the skull must always place the individual on a higher level—the index will be lower as long diameter is *greater* relatively to transverse diameter—than when the index is calculated from measurements taken upon the head,—the index here will be higher as the height is *less* relatively to the breadth.

A glance at the table of measurements will show that the lower one goes in the scale of caste, the greater is the difference between the nasal index as observed on the head and that as calculated on the skull. This is well shown in the indices of the women—in No 55 Rajpoot female the difference is 11 (59 6–48); in the women of the cultivator class (Panjabi Musalman) the difference is 21 (72 1–51); whilst in the Chuhra women it is 25 (77 5–52 4).

Septum Nasi Before leaving the anterior nares I may note that a straight septum is the exception in 126 skulls and heads it was deflected in 111 (to the right in 47, to the left in 64), and was straight in only 15. The deflection was so great in some of the cases as to touch the inferior turbinated bone Also in cases where the anterior nasal aperture was unsymmetrical the deflection was without exception towards the deformed side

The points I have endeavoured to demonstrate, the facts adduced, or the theories advanced, are then briefly as follows —

1. The "root" of the nose on the head rarely corresponds to the nasion on the skull.
2. The long diameter of the nose on the skull is generally always greater than the height of the nose on the same head.
3. The breadth of the nose on the head is always more than the transverse diameter of the anterior nasal aperture on the skull, and this difference is greater in individuals of full adult age than in young persons.
4. The nasal index of a race calculated from measurements on the *heads* of its members, will never be equivalent to the nasal index of the same race calculated from observations upon the *skulls* of persons of that caste
5. The *skull* nasal index will place the caste on a higher platform than the *head* nasal index
6. The lower the caste the greater will be the differences between the *skull* and *head* nasal indices
7. The absence of a sharp inferior margin to the anterior nares is common in ordinary Panjab skulls, together with, in many, the sloping down of the floor of the nasal fossae to the alveolus.

8. The anterior nasal aperture as to outline presents two main types, *viz* .—

A CORDIFORM { *Regular* / *Lyrate* / *Irregular*.

B ROTUND.

The three varieties of the first type depend on differences in the pre-nasal notch and its two bounding processes

9. A deflected septum is the rule—a straight one the exception.

I have to thank my friend Dr. Dickson of Lahore for his kindness in photographing the skulls.

EXPLANATION OF PLATE

Fig 1. Showing straight nasal bones—absence of curvature in whole extent.
Fig 2. Showing nasal bones short and curved throughout the whole extent.
Fig. 3 Showing the profile of nasal bones concave above and convex below
Fig 4. Showing the nasal processes of superior maxillæ to be prolonged to a higher level than upper extremity of nasal bones.
Fig 5. Showing the upper extremities of nasal bones and nasal processes of superior maxilla to be on the same level.
Fig 6. Showing ordinary condition of the nasal notch where the nasal bones occupy a higher level than the nasal processes of the superior maxillæ.
Fig 7. Showing the "*Regular Cordiform*" nasal aperture
Fig. 8 Shwing the "*Rotund*" type of nasal aperture.
Fig 9. Showing the "*Lyrate Cordiform*" nasal aperture
Fig 10. Showing the "*Irregular Cordiform*" nasal aporture.
Fig. 11 Showing the inferior margin of the anterior nares rounded and levelled off to the alveolar surface—considerable prognathism
Fig. 12. Showing an example of unsymmetrical anterior nares.
Fig. 13 Same as Fig. 11.
Fig 14 Skull of young gorilla.

Table of Nasal Measurements upon the Heads and Skulls of sixty-two "subjects". Of these fifty-four are males and eight are females

Serial No	Age	NAME	CASTE OR TRIBE	NASAL DIAMETERS (*in millimetres*) On Head L	Br	Index	On Skull L	Br.	Index	No. in D R Register
1	50	Nain Sukh Nath	Low Caste "Hindoo"	48	30	62 5	55	27	47 2	21
2	70	Doola Nain		47	34	72 3	55	23	41 8	25
3	32	Raja Singh		45	32	71 1	48	24	50	44
4	50	Gunga Ram		50	32	64	53	25	47 1	61
5	65	Golab		44	39	88 6	48	29	64	18
6	45	Gunga Ram		45	29	64 4	52	28	64 2	9
7	?	Muthra		47	30	63 8	56	27	48 2	1
8	32	Gunga Ram		43	34	79 6	54	28	51 8	50
9	20	Man Mudh		47	29	61 7	49	24	48 9	40
10	40	Atma Raw		50	35	70	57	24	42 1	55
11	60	Jowahir		49	38	77 5	55	26	47 2	81
12	40	?		47	32	68 8	57	25	43 8	24
13	35	Sunder Singh		54	34	62 9	54	28	51 8	62
14	30	Thakoor Singh		54	32	59 2	55	26	42 1	68
			Average	47	32	68 5	53	25	47 1	
15	35	Gurdit Singh	Jat	49	37	75 5	51	30	58 8	64
16	30	Bhola Singh	(Sindhi) Hindoo	49	35	71 4	50	24	48	74
17	60	Kikri	(N -W P) Hindoo	43	37	86 4	48	27	56 2	73
18	44	Mukha	Panjab Khatri	50	39	78	54	28	51 8	83
19	60	Sharif	"Panjabi Musalmáns"—"Cultivator" Caste mostly	46	33	71 7	51	26	59	10
20	35	?		52	30	57 6	51	21	41 1	12
21	50	?		46	30	65 2	52	25	48 7	8
22	60	Bauli Baksh		51	34	66 6	52	27	51 9	47
23	67	Kassu		50	34	68	54	24	44 4	42
24	60	Dido		46	34	73 9	51	26	59	11
25	60	Mahia		44	28	63 6	55	23	41 8	6
26	?	Dhunda		41	31	75 6	48	25	52 8	4
27	45	Bhagu		50	30	60	52	25	48 8	66
28	60	Rahim		57	34	59 6	57	30	52 6	67
29	40	Pir Baksh		49	37	75 4	51	27	52 9	57
30	35	Bolanda		49	29	59 1	54	24	44 4	43
31	40	Mehtab		49	34	69 3	53	24	45 2	56
32	19	Manga		50	29	58	52	27	51 9	65
33	65	Kutab Din		49	34	69 3	55	25	45 4	19
34	30	Habib		54	32	59 2	56	23	41 7	63
35	30	Shadi		47	30	63 8	53	25	47 1	60
36	40	Imam Din		44	38	86 3	48	27	56 2	71
37	47	Rehana		50	35	70	54	28	51 8	72
38	20	Kalu		59	33	55 1	57	26	45 5	76

Serial No	Age	NAME.	CASTE OR TRIBE	NASAL DIAMETERS (*in millimetres*). On Head L						No in D. R. Register
				On Head			On Skull			
				L	Br	Index.	L	Br	Index	
			Brought forward							
39	30	Chiraj Din	"Panjabi Musalmáns"—"Cultivator" Caste mostly	45	33	73 3	49	25	52	77
40	70	Faquir		53	35	66 3	54	27	50	88
41	40	Dittu		51	29	56 8	50	25	50	90
42	?	Ioona		46	32	69 5	50	28	56	3
43	25	Bahadri		49	32	65 2	56	21	37 5	78
44	22	Chandan		49	31	63 2	58	25	47 1	79
45	30	Hira		40	28	70	51	23	45 9	14
46	?	Alia		39	36	92 3	49	29	59 1	5
47	50	Ilahi Baksh		49	33	67 3	48	24	50	80
48	50	Dilawar		48	37	77 8	52	28	53 8	37
			Average	48	32	66 6	52	25	48	
49	33	Rajjul	Afridi (Pathan)	52	33	63 4	59	24	46	39
50	70	Kutab Shah	Seyid—should be of Arab descent	52	34	65 3	56	27	48 2	15
51	30	Golab	Panjab Chuhras	49	37	75 5	48	23	47 9	89
52	30	Mokand		51	35	68 6	51	26	50 9	80
53	40	Kala Din		45	35	77 7	49	25	51	33
54	60	Ratti		49	34	69 3	53	29	54 7	48
			Average	48	35	72 7	50	25	51 1	
EIGHT FEMALES										
55	55	Mehtab Bibi	Musalmán Rajpoot	52	31	59 6	52	25	48	54
56	35	Rajain	" " (?)	44	28	63 6	48	21	43 7	20
37	25	?	"Panjab Musalman"—"Cultivator" Caste mostly (?)	43	33	76 7	48	25	52	27
58	80	Satai Bibi		43	33	76 7	46	24	52 1	38
59	60	Khairau		39	30	76 9	44	27	61 3	7
30	40	Tabi		47	33	70 2	49	25	51	29
			Average	43	32	74 4	47	25	53 1	
31	70	Tabao	Chuhra	44	37	84 8	50	27	54	32
32	30	Fazloo		45	32	71 1	48	24	50	82
			Average	44	34	77 2	49	25	51	

Fading Histories —*By* S. E Peal, F R.G.S., M A S.B., &c.

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In a general way it may be said that until comparatively modern times histories were supposed to be found written in books, or inscribed on stone in some kind of hieroglyphic character or writing, but a notable feature of our day is the increasing facility with which we can interpret the varied records of the past in other ways What of our earth, for instance, in the vast series of geological remains, that of the development of plants and animals, as stored in the stratified crust, and that of the human race, not alone in recent strata, but as recorded in the many and peculiar social customs surviving to our day Thanks to the exertions of Anthropologists, this new art of reading the past through surviving customs has of late enormously developed, and in few departments of the subject is greater interest exhibited than in the elucidation of the earliar phases of social life, and all that relates to the origin of marriage and the family Until lately, it was generally assumed that—as among some of the lower animals—the primitive element of the society from the first was "the family", that in some form or other the institution of marriage had always existed. Of late years, however, and as a result of careful investigation, it is becoming more and more apparent that the social systems seen among the most uncivilized races, their often peculiar organization, terms of relationship, and endogamic and exogamic rules, seem to point unmistakeably to a more archaic stage, wherein the primary social element was, not the family but the small communal horde A horde, however, in which there was more or less law and order, and not, as too often imagined, a social chaos, yet in which "marriage," or the private right in female slaves, had not arisen In his introductory remarks on the "*Tribes and Castes of Bengal,*" Mr. H H Risley tells us that "the principal points which it was supposed a record of Indian customs might help to clear up, are the early history of marriage, the development of the family, modes of relationship," &c. And without a doubt, when the many savage hill races of our Eastern frontier are carefully studied *in situ*, many unsuspected traces of former communal association will be found, confirming the supposition that it is among these races, and not among the Australians, that these fundamental problems will be solved But the necessity for a little more expedition in recording and collating the surviving customs of semi-savage races is well seen in Mr Risley's work. On all sides we see these non-Aryans being rapidly Hinduised, losing their old, and adopting new customs Infant marriage is rapidly supplanting the adult ceremony, and individualism over-riding the communal traits Thus it is most desirable that all available information in regard to our Eastern and North-Eastern savage races should be collected at the earliest possible moment, both on scientific and administrative grounds Twenty or thirty years hence, unless the men of our day bestir themselves, the Anthropological world will be fruitlessly bewailing lost opportunities

Many of our leading savants have long regretted that more effectual and systematic efforts have not been made to work out the languages, customs, and histories of the races so rapidly changing or dying out, but few of them can be aware of the speed with which the old order is giving way to the new, not here in India alone but all over the Archipelago and Pacific, with which regions our savage races are so closely related Not long ago, the so called "Cannibal Batta" of central Sumatra, were almost unknown Now I learn from Mr Snuggs of Singapore and Lake Loba, that many thousands of them are Christians, and I was presented with a New Testament printed in their singular native character From Borneo we hear that the Dyaks, Dusuns, and many other wild tribes, are being rapidly weaned from their wicked ways and becoming yearly more alive to the benefits of peaceful trade The Papuans under the fostering care of Sir William Macgregor and the numerous missionaries, are rapidly becoming civilized, breaking out in pants, shirts, and wide-awakes Genuine old stone axes, I am told by a good authority, are now absolutely unprocurable, and the manufacture of spurious curios has begun. Polynesia is being even still more rapidly and effectually revolutionized From one end to the other, aboriginal customs are about as difficult to get hold of as aboriginal costumes. Despite all efforts to preserve them, the Maori, as a race, are doomed, and ere long will have disappeared. The Australian "Blacks" are rapidly following the now extinct Tasmanians.

In India, again, some of our aboriginal races are dying out, and most of them are changing "Progress" is in the air everywhere, and we shall soon lose much of the material out of which their past histories might have been recovered I have known one group of the "head hunting" Naga since the year 1865, and was particularly struck at the change in them when I visited one tribe in 1883, to collect implements, dress and weapons, for the Calcutta Exhibition Where things had formerly been good and plentiful, I found many either quite unprocurable, or so bad and sophisticated as to be useless or even misleading The singular "kyep," or hide cuirass, (identical with that still seen in the island of Nias, West Sumatra) used during raids and forays to protect the body from arrows and spear thrusts, was quite given up, thanks to the introduction of firearms. I had to wait a whole week while men went to villages on the back ranges for most of the things Taken in time, however, there are probably few tribes which, if carefully examined, would fail to yield something of value, as illustrating tribal history or elucidating racial questions of interest

But the desirability of a more intimate knowledge of the habits and customs of our own semi-savage races can be placed on higher grounds It is often difficult, or almost impossible, to avoid administrative mistakes when legislating for the benefit of extremely ignorant races, in consequence of our limited knowledge of their customs Not many years ago an attempt was made to curtail the system of "jhum" cultivation near Darjiling The local chief, anxious to please, promised co-operation, but as the event proved no effect was produced A considerable amount of correspondence ensued, deploring the stupidity of those who thus needlessly shifted their cultivation sites and wantonly destroyed valuable forest

To this day it is very generally believed that "jhuming" is resorted to in consequence of impoverishment of the soil after a two-year cropping, and that for some unknown reason the exhaustion is so great that a third crop would result in failure Yet, as is so often the case, the solution for this long-standing enigma is simplicity itself if studied *in situ* It is due, in almost all instances, to the rapid development of grasses, whose minute seeds at times fill the air in millions, and germinating on the cleared sites, send their roots among the stones, whence they cannot be eradicated by the primitive culture available. In the 3rd and 4th year the growth of grasses is so rank that a grain crop is hopeless, and the site is abandoned Creepers and young trees however soon kill out these grasses, which cannot grow in shade, and by the 7th or 8th year the abandoned jhums are re-afforested, and ready in turn for re-jhuming

One of the main things to notice in this system is that each village community, nay each family, needs about 7 and 8 times as much land to raise the crops on as by other methods, and on the different hill sites the plots are all generally marked by paths, streams, or khuds.

Though the private right in these plots is religiously respected, yet individuals may not jhum them when they please these are communal matters, and are settled at communal councils.

The barbarous custom of "head hunting," again, is one which it is most desirable to study *in situ*, and appears to offer far more promise of successful legislative interference It is practically a deeply-rooted fashion, and by no means a necessity like "jhuming"

Among many tribes it has been given up, and where it is still in vogue seems largely due to the young women chaffing the young men who are not tattooed, or otherwise distinguished as "Braves" But inasmuch as, at least half the heads taken are those of women and children, this decoration, as a test of bravery, is now heavily discounted by all parties, and very little pressure by the paramount power would put an end to a custom which, there is good reason to believe, is already unpopular among the rising generation.

A fairly safe estimate—judging by the skulls in the Morongs—would give about 12,000 murders, in about 40 years, on an area roughly 20 miles square.

Between the years 1865 and 1880, I had good opportunities of becoming well acquainted with one large group of these "head hunters" lying between the Disang and Dikhu rivers, south-east of Sibsagar, Assam.

In a hazy way I thought I knew a lot about them, visited their hills and villages, employed them in clearing land, &c

It was not until I had left the neighbourhood, and lost my chances for some years, that I began to see how little I really knew regarding them, and what a vast mine of most valuable information—much needed by savants—lay for years alongside me unheeded

When I began to read systematically works on the Pacific and Malay Archipelago, it slowly dawned on me that our "Naga," were nothing more or less than Northern Dyaks · that the notorious "head hunters" of Borneo, judging by their physique, houses, modes of cultivation and warfare—by their dress, arms, and even down to trivial details, were not only allied, but closely related racially, to my former savage friends

But the more carefully the matter was looked into, the more obvious it became that these same races extended still further afield, and are seen in the Battak of central Sumatra and the equally savage "head hunters" of Formosa, whose dress, arms, houses, physique, and customs are also almost identical with our savages, and obviously of the same stock For the first time I got a practical glimpse of the outskirts of the greatest of our Ethnographic problems, in the origin, development, and intercrossing and migrations of the various races overlying the Africo Indo-Australoid aboriginals of the Indian and Indo-Pacific region.

Here, and in our own times, we see the Kuki move north, followed by the Lushai, who in turn are pressed forward by others The Mikir once inhabited the Jaintia Hills, and are now, I hear, beginning to cross to the north bank in small numbers Before our eyes, in our own day, the Miri are slowly and surely extending westwards. In our

Naga Hills the new villages are almost invariably to the north of the old ones

As an illustration, let us examine the group lying between Disang River and Dikhu, south-east of Sibsagar

Taken in the main the Naga, so-called, extend from E Long 96° 10 near the Namrup river, in a south-westerly direction, through all the hills bordering Assam, to the confines of Manipur and Kachar How far they extend to the south of the Patkai is unknown. Except on the extreme north-east and along the border next Assam, they are not sharply marked off by either physique, customs, or language, from adjacent races The Angami having Bodo or Kachari affinities, and Rengma closely allied to both, and also Mikir Singularly enough the Mishmi, who seem to have been cut off from this alliance by the Shan and Singphu intrusion, are said to be most closely allied to the Kuki, one at each extremity of the long Naga series, and both of a ruder, and archaic type Both physically, linguistically, and in customs, weapons, &c, there is said to be less difference between the Mishmi and Kuki than there is between the Mishmi and the adjoining Abor-Miri Like most other savage tribes, the Naga fall into large sub-groups, which are again generally sub-divided, and the term "Naga" appears to be a comparatively recent Anglo-Bengalism, probably derived from the word 'Noga,' by which they were known for centuries to the Assamese. This in turn has undoubtedly been derived from the word 'Nok' which means *folk*, in some of the hill dialects When strange parties of them meet in the plains we hear them ask "Tem Nok é," or "O Nok é," i e, *What folk are you?* and the term is self-explanatory in such village names as "Nok pan," *people of the tree*, "Nok iang," *the folk in the sky*, "Nok jan," *the folk at the iron* (mines), &c The late Raja Rajendra Lala Mitra, informed me that he had little doubt that "Nok" was no other than the Bengali *Lok* (or *log*) to which we are almost daily accustomed. It is worth noting that the Khonds call themselves Kui loka, and the Uraons call themselves "Ku nok," *the folk* or *men*, *Ku* being the defining prefix, as in Ku Mi, *the men*, seen in the race having that name So that the term "Naga" seems to have nothing whatever to do with snakes and snake-worship, as often supposed, at least among these races.

But returning to the question of the possibility of unearthing some local history from these people ere it has faded for ever, let us examine a little closer the group lying between the Disang and Dikhu rivers and north of Patkai On this area we find a well-marked section, composed of some 46 villages, now split up into some 8 or 10 distinct sub-tribes, often at war with one another, yet all reputed to be descendants of one village called "Chang Nu. a sort of tribe-mother to whom many of them salaam, and annually send small presents, which, however, are not tribute. A peculiar proof that all these 46 villages, and 8 or 10 tribes, are a distinct sub-group, is seen in the fact that over this area, and not east or west of it, the houses have a remarkable peculiarity, the central row of posts project from 4 to 8 feet above the ridge-pole, and they are lowered down, through the roof as they decay below, in the ground. The tattoo marks on the face are also practically the same all over this area, though the dialects vary slightly, as usual among "head hunters," through frequent isolation.

The subdivision of a tribe into clans, and the origin of totems, are even yet looked on as obscure features In Australia and also among some Indian races, the totem is frequently held sacred, and clan development has long ceased, but in the group of Nagas above mentioned, we can trace both clan development and the origin of the totem pretty clearly Some 20 years ago, and after considerable trouble, I made out a rough map (ere the survey was taken) of the villages on this area, pinning out on a large board variously colored gun wads, each village of a tribe being of the same color Thus, "Changnu" and its sub-villages were all red, all the "Yanu," or Joboka, blue, the "Zu," or Banpara, green, &c., and by dint of repeatedly cross-questioning the more intelligent old men, I got, after two or three years, a glimpse of the tribal migrations, and sequence of the offshoots An approximate means of obtaining dates was afforded in some cases by tabulating the list of chiefs, at any village after its foundation, or before or after any notable event. Thus, there were eight successive chiefs (say 25 years each) in "Changnu" after its foundation, ere the Zu, Runu, or Banpara, split off, and travelling N E as a horde, established themselves on their present site, displacing a former race called the "Mopia," who were driven down into the plains and amalgamated with races already there After several generations an offshoot from Runu founded Wanu, and later on another swarm from Runu (called the Hoyan Khel) split off, and travelling north-east, *viâ* Chopnu, asked for and got a chief, and settled at Rusa This chief's family dying out, they asked for and got another one from Yanu, or Yansa (Joboka), and this accounts for the otherwise inexplicable fact that when Chopnu and Rusa are at feud with Runu (or Banpara), the Yansa (or Joboka) invariably join the former, and thus place Runu between two fires.

It seems that there have been about 12 generations in Zu or Runu, (Banpara of the Assamese), since its foundation. The names of the chiefs are as follow —

1, Rangtok, 2, Rami, 3, Long mai, 4, Tin san, 5, O. ra, 6, A vang, 7, Lo vang, 8, Ra long; 9, Kam vang; 10, Lai vang; 11, Ting pong; 12, Pan bang.

Taking 25 years to a generation, the age of this tribal offshoot of Sangnu would equal approximately 300 years, and if we count the eight generations in Changnu, ere Zu split off, at the same duration, or, say, 200 years, we get a total of 500 years as possibly the age of Changnu, or A. D. 1350 There are reasons for believing that, if anything, the above is under-estimated On examining the map we find the most remarkable proof of the slow northerly or north-easterly drift of these races in the names of many of their villages Among them all, "Nu" means mother, larger, older; and "Sa" means, the child, younger, smaller Yannu is thus the parent of Yansa (to the north), though the latter is by far the larger and most important village nowadays Rusa again we find north-east of Runu, Chopsa is north-east of Chopnu, Chasa is north-east of Chanu, Changsa is north of Changnu In the cases of Niaosa and Nisa alone do we find any of the "new towns" to the south, and it seems that it has been due to the advantages of a fine unoccupied site for 'jhums' lying in that direction, and not far off We see precisely the same evidence lying east of the Disang river among the Bordurias, or "Le nu," whose villages, eight or ten in number, lie to the south of those of the Namsangia, or "Le sa" Now there is a tradition among some of the people of those hills that in long times past they drove another race out before them into the plains, a race called the "Mopia." I have frequently been invited to go and examine the sites of some five of these Mopia perched villages and satisfy myself of the truth of the above From superstitious motives these old sites are not now built on by the present race, and the names of these departed villages are Ting Koi, Mo kan, Mo boko, Ting ra, and O Hoak, and the proofs that they were the village sites of a preceding and now departed race are exceedingly beautiful. Although for hundreds of years these sites have not been built on, and some are at times partially 'jhumed,' there are, to this day, the deeply-worn footmarks of the past generations of women and girls, in the rocks leading down to the water-springs in the gullies at the village, footmarks not cut or chipped, but slowly worn out by the bare feet of those passing up and down daily for centuries, ere their race passed away for ever But as a glimpse of past history in these hills, this is not all; for tradition speaks of a still earlier people with the suggestive name of "Mainak nok," or Monkey folk, whose stone implements, or arrow and spearheads, are now reported to be found over all the hills occasionally When found they are not touched by hand, but are lifted by a dao, and thrown down the nearest khud. Thus, as we see by the result of a few casual enquiries made many years ago, without any clearly defined aim, we may rest assured that a sustained and systematic survey would reveal a great deal of not only interesting but valuable information

A carefully worked out monograph, well illustrated by vocabularies, by maps, sketches, and above all by photographs, of such a group as that of the "head-hunters" above referred to, would be invaluable to anthropologists, and would enable us the better to understand these semi-savage races. But over and above questions of affinity and local history and questions of administrative utility, there looms one of steadily increasing interest which a careful study of these people is pre-eminently calculated to solve· namely the question of the origin of marriage and the family.

We appear to be rather rapidly approaching a momentous reformation in regard to our views of social evolution Until comparatively recently it was generally supposed that "the family" had always been the primal element of the society that from the earliest times, the institution of "marriage," whether by capture, elopement, or peaceful arrangement, had been in vogue Sir John Lubbock, it is true, had ventured the opinion that "marriage" (or the appropriation of one particular female by any man) was preceded by a stage of communism, a view which has been more or less virulently assailed But it is beginning to dawn on those who have studied these questions, among savage or primitive races, that such a phase of social evolution was after all not only possible but probable indeed that it may eventually be found as the only feasible solution for many strange survivals, otherwise quite enigmatical It is a remarkable fact that, though the Australian races are so low in the social scale, having apparently always been (like the late Tasmanians) semi-nomadic, and unable to cultivate, or to build permanent houses, yet the earlier stages of social development and the origin of marriage, are less likely to be traced among them than among the races in India Dr E B Tylor points out in his preface to Ling Roth's "Tasmanians," that these people were found in the chipped-stone, or Paleolithic stage of development, yet their social arrangements, like those of the Australians, exhibited the institution of marriage very distinctly developed The leading feature in all cases being that the female slave (called by courtesy the wife) was the man's private property "In all stages of life the female was the property of some male—when young of her father or his heirs, and later on of her husband." Whether the Australians on first landing on the continent had the institution fully developed or not is uncertain, but it is obvious that from the very nature of the surroundings it would be rapidly developed The value of a female slave as a foodgatherer, nurse, and general servant, would be obvious. Referring to this matter Lieut.-Colonel T. L. Mitchell in his "Three Expeditions in East Australia," Vol: I, p 307, says —"Considering the industry of the *Gins*, in making mats, sewing cloaks, mussel-fishing, rooting, and their patient submission to labour, always carrying the bags which contain the whole property of the family, the value of a *Gin* to one of those lazy fellows may be easily imagined Accordingly, the possession of them appears to be associated with all their ideas of fighting, and they go over to the victors after a battle" This very conspicuous development of the institution of marriage amongst the lowest races of mankind, naturally led many to infer that it had existed in all ages, and was not preceded by any other form of sexual association.

For many years now, the peculiar social systems seen in Australia have been made a special study by *savants* Here the rules of kinship, and clan sub-division are peculiar and elaborate, and it was thought until recently that the aim of their exogamic restrictions was to frustrate the inter-marriage of near kin. The tribe or clan was almost invariably divided in two or four sub-groups, each with its totem, between the members of which alone marriage was possible, and within each of which it was not permitted Thus an Emu could not marry an Emu, but could marry a Kangaroo, and *vice versa* But as E M Curr has observed, "the system, as one writer has remarked, seems too intricate to have been the invention of tribes so low down in the scale of mental capacity as ours." And this view is now rapidly gaining ground, and the belief that these singular exogamic customs are a natural growth from a stage wherein there were communal groups is in the ascendant in fact that tribal, and not blood incest was the social sin, that the monopoly of any particular tribal girl by a male member was resented as a social offence. Thus "marriage" would be possible only, as Sir John Lubbock suggests, by capture of a girl from another clan or tribe, possibly at times by elopement, or later on by exchanges When in Australia lately I had the pleasure of meeting the Reverend Lorimer Fison, and also Mr. A W Howitt, both of whom are anthropological experts, and have for many years closely studied the local customs The results of their investigations seem to show that the Australian marriage rules belong to a more archaic stage of society,—to a communal stage, in which intercourse was unrestrained, and even consanguine. The traces of this former era are nowadays but dimly visible, but are occasionally unmistakable Formerly, among the tribes of Gippsland for instance, each recurrence of the Aurora Australis, was interpreted as an exhibition of the wrath of the Great Spirit at their departure from the *ancient customs*, and the peculiar rites practiced during this orgie leave no doubt whatever that consanguine intercourse was common in the past, and that the horror of incest was not the cause of the present exogamic marriage customs. It is notorious to all who have had much experience of them, that "savages have no morals," as we understand the term. From America, Africa, Asia, Polynesia, the Archipelago, and Australia we hear the same story repeated, and hence it is singular to find that formerly so many writers attributed the Australian exogamic marriage laws to the savage's dread of consanguine alliances, the more so when from the very nature of the case there could be practically little or no supervision of the young of both sexes in the camps If persistent and disastrous results invariably followed consanguine marriages, we could understand that the Australian aboriginals would be naturally led to view them unfavorably and to institute social laws, against them But the evils are debated

The prevalence of exogamic customs, therefore, over such large areas and among so many races would seem to show that it is a quite natural development from a stage of group communism, that in all cases, as before stated, it was the monopoly of a communal female and not close blood alliance which was the sin. It is very strange, but nevertheless very true, that many writers on this subject appear to have had little or no practical knowledge of savages, whose peculiar and often startling social customs they desire to interpret As a necessary consequence, some of the interpretations are occasionally of a startling nature, having been arrived at through a process of highly civilized theorizing

Too often, it seems to me, we are apt to judge the savage by our own civilized standards, and it is notorious that he returns the compliment with compound interest. The distinction between sexual intercourse and marriage, which with us is in ethical theory *nil*, was with savages profound, one was a recognized and regulated juvenile amusement, whereas "marriage" within the social group, would be a social crime While intercourse with a group sister was no crime, her seclusion, or monopoly, by "marriage" would be intolerable and resented by all tribal brothers Yet the members of a group or clan were all called "one blood" (as in Australia), and hence has arisen our supposition that exogamy was deliberately instituted by races confessedly destitute of morals to avoid doing that which was a notorious habit, not only in past times, but in our own. Among our Oraon, Sontal, Munda, Malé, Savars, Kharias, Kands, Gonds, Juangs, and other totemistic, ruder non-Aryan races, amongst whom we find, at times, a more or less complete communal association, with barracks also for the unmarried and sexual liberty before *adult* marriage, we learn that the "liasions between girls and boys in the same village (commune) seldom end in marriage." In other words sexual intercourse within the Totem is permitted and even provided for, but marriage is not allowed, and when it takes place outside, is often a mimic capture. Thus "exogamy" appears to have been a quite natural, or even inevitable, development from a communal group stage. The view that the primary element in human social evolution was the family seems to be giving way, the more we examine closely into these matters, to a belief that this element was the communal horde, in which there was no marriage, yet at the same time no social chaos, for wherever we meet with free intercourse before marriage, among our non-Aryan, Insular, Pacific, or African races, we find it carefully, and at times elaborately, guarded by laws and etiquette.

Many of the proofs of this communal, or pre-regulated marriage era, are undoubtedly to be found in India, and probably among our non-Aryan aboriginals of Bengal and also our eastern hill races, where so many essentially communistic customs are in full force* Ere leaving Australia, Mr Fison and others warmly urged me to pursue these enquiries, if possible, and to unearth all the available evidence sought by *savants*, so as to place the matter, one way or the other, beyond dispute. The singular communal barracks for young unmarried men, and occasionally young women, referred to by me in the *J A S B*, Vol. lxi, Part II, No 3, 1892, seem to be the relics of a former communal era The enormous geographical range of this custom, which extended from the Marquesas, on the east, all across Polynesia and the Archipelago to West Africa, and from the Himalaya in the North to New Zealand in the South, demonstrates its extreme antiquity. It preceded, in fact, the differentiation of both physique and language over this vast area

Careful study of such a group, say, as the "head-hunting" Naga, ere they are reformed and hopelessly sophisticated, would undoubtedly tend to clear up these and many other most interesting and important anthropological problems, not only of local, but of truly world-wide and lasting value The information gained in regard to the possibility of terminating these head-hunting feuds, of better understanding and perhaps curing eventually, the custom of jhuming, of opening up these hills generally to trade, and glimpsing the races beyond the Patkai, so far unseen, would also be of administrative value.

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* Such as Polyandry, where several brothers have one wife in common, or the Punaluan family marriage, wherein brothers hold their wives in common, and sisters their husbands

On Flint Implements from the Kon ravines of South Mirzapore —*By* JOHN COCKBURN, *Asst. S Dept., Opium Agent, Meja Road, E I R.*

With Plates IV, V and VI.

This series of implements, 43 in number, was found in some deep ravines near the village of Kon, in South Mirzapore The locality was originally discovered by me. These ravines seem to have cut through a Neolithic burial ground, as well as through the site of an implement manufactory, and I found tolerably perfect human calvaria together with glazed earthenware cups, stone hammers and flakes and spalls, &c., precisely similar to others I have found in such interments, when exposed by denudation In many cases I have seen a perfect section of the grave exposed I noticed two such at Barkacha,[1] five miles south of the town of Mirzapore, and again at Mozufferpore, near the stone dam over the Chunderpurba river, in the family domains of the Maharaja of Benares

However, the implements to-day exhibited are none of them from graves. So numerous are waste flint chips in this locality (properly called spalls), that I collected several hundredweight, and after roughly picking out the choicer specimens buried the remainder under a marked tree, in a câche. Some time in 1883, I directed Mr Hodges, Executive Engineer, then on special duty in Mirzapore, to the locality, and he employed the men I had trained to search for him, and some of his specimens are, I believe, in the Lucknow Museum

Recently Mr W Crooke, C. S , Collector of Mirzapore and Director of the Ethnographical Survey, has visited the locality, and sent some of the flint chips he found to the Society—(see paper by Dr W King in the *Proceedings A. S B* , Feb 1893, p. 53). The site, however, is Neolithic rather than Palæolithic, and I have here obtained some of the most perfect specimens of Neolithic stone industry found in India Among them was a flat stone bangle made of slate, which had clearly been turned on the lathe I also found many perfect specimens of flat oblong polished celts of diorite. These specimens are shown in Figs. 37 to 40 but as the lithograph is from a photograph of the specimens as they lay flat on their sides an imperfect idea of their beauty and shape is conveyed. One of the celts, a highly finished and polished specimen of black basalt of the usual lanceolate type, had the side edges square and flattened, and is probably the first specimen of its class found in India, though they are common enough in England This specimen is Fig. 41, Plate VI, and is unfortunately broken in halves

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[1] I was present at the excavation of two of these graves at Barkacha The bodies lay north and south, within stone circles about 12 feet in diameter They were extremely deep, from 6 to 8 feet One contained the fossilized skeleton of an adult human male, of large size, with a flat dish of glazed pottery at the head, and one at each corner of the tomb One of the articles found was a long, narrow lachrymal vase of green glass about 7 inches long The other was not completely excavated, and contained two stone hammers and sundry flint flakes The first body lay on a thick stone slab I entered some dozens of built-up cairn graves here, but found every one of them had been rifled of their contents, probably by Nuts or Canjurs

I have recently unearthed the specimen from among others in my collection and it is of great beauty and made of very hard material

It is almost a *facsimile* of the specimen figured at p. 105, Fig 59, of Evans' "Ancient Stone Implements of Great Britain"

I also found half of a remarkable glans-shaped object of polished diorite with a perforation down the centre, the use of which I have not been able to discover I have also again recovered this specimen which I thought I had lost

From the great skill with which it had been perforated in a hard material, there can be little doubt that it belonged to highly advanced people of the stone age The base did not exceed $\frac{5}{8}$ of an inch in diameter with a depth of probably 3 inches. Ring-stones and hammers were also common Two of the former (ring-stones) are to be seen at Figs 13 and 22, Plates IV and V

The specimens are not accessible to me at present, being stored, such as are not lost, in the godowns of a distant *koti.* The evidence is quite enough to show that the locality was Neolithic On the other hand, the greatest interest attaches to the fact that well-marked Palæolithic types of chipped chert heart-shaped celts are very common, as well as a discoidal type of implements shown at Figs 2, 3 4, 6 and 26 Of these Figs 3 and 4 give a good idea, Fig 21 is a side view of an indifferent heart-shaped celt, of this type, Figs 26 to 36 which also represent these heart-shaped celts give no idea of their form. Neither the celts nor the discoidal implements would have caused comment had they been found at the Hinoutee Palæolithic locality, described by me in my paper on "Palæolithic Implements from the drift gravels of the Singrauli Basin, South Mirzapore," *Journal* Anthropological Institute, London 1887, pp 57–65, except that chert implements are not common there, the bulk of them being quartzite, yet I have half a dozen good specimens of implements of chert from Hinoutee. One of these discoidal implements from Hinoutee made of chert, was declared by Mr. C. H. Read, in the discussion which followed the reading of my paper and exhibition of specimens, to correspond exactly in shape and color, with specimens found in Suffolk, England, though the discoidal type, with an edge all round, is not common in England. The question here arises, must this intermingling of Palæolithic and Neolithic forms in the same locality be regarded as an accidental selection of the same site by two peoples at different ages or stages of civilization, or were both forms made and used together. I prefer to believe that they were made and used together in this particular locality. There is no reason why a hâche, or rude chipped hatchet of flint, should not be as serviceable as a polished hatchet of the same material. Indeed, as flint and chert are better and more efficient cutting implements, as the edge keeps chipping away and thus renewing itself, there is strong reason to believe that a roughly chipped flint axe was preferable to a polished one of the same material. The only hard materials of the quartz family that I have hitherto found polished, have been agate beads and bracelets, doubtless also of great antiquity, and of the stone age. The fact of the well made flakes and javelins and arrow-heads being of the same chert as the chipped celts and discoidal implements, is much in favor of their having been made at the same time. At the risk of being branded an antiquarian infidel, I must disclaim my belief in the theory that Palæolithic man did not possess sufficient intelligence to sharpen the edge of a hatchet by grinding, a process that the boar and stag perform every day with their natural weapons, while the wild elephant grinds his tusks to a lovely chisel-edge. I have myself found Palæolithic chipped implements of chert, of manufacture equal to the best Neolithic, in undoubted Palæolithic localities and alongside typical rough Palæolithic hâches of quartzite. This convinces me, that no want of knowledge of the art of grinding an edge to an implement prevented Palæolithic man from giving a high finish to his weapons, though a want of a capacity for taking trouble is eminently a savage trait. The implements used by pre-historic man, when he wandered, a heavy-fanged and nameless savage, half brute half man, along the banks of rivers or the sea shore, was a rudely split pebble. At the same time I am prepared to admit that the two ages may, and must have overlapped, and that the cases met with by me may have been instances of such overlap.[1] Similar instances of superior workmanship occur among implements from the river-drift in England. Figure 435 of Evans' "Ancient Stone Implements of Great Britain" is an instance in point (from Tanton, Downham). This very closely resembles my finest chert Palæolithic specimen from Hinoutee (now in the British Museum), except that my specimen is circular in outline.

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[1] The now extinct Tasmanians apparently never progressed beyond the Palæolithic stage of stone implement manufacture.

It will be observed that the chipped implements are all made of a black siliceous material closely resembling flint, called chert. It is probably of the same origin as the flint of the cretaceous formation, i e, derived from the siliceous bodies of sponges and other marine animals at some depth under the sea. There can be no doubt that the chert is derived from the Lower Vindhian limestone rocks in the vicinity. Indeed, the Lower Vindhian strata crop-up in the ravines themselves, and at the southern margin of the ravines abut against the red gneiss of South Mirzapore From the large size of the implements exhibited, there can be no doubt whatever that this was an exceptionally favorable locality for procuring chert in large blocks, probably the finest on the borders of the Sone There is only one other locality in India where flakes of similar dimensions and workmanship have been found, and that is near Rohri in Sind, and in this case the material was true nummulitic flint, and the flakes produced from it are so perfect that they could hardly be matched with the pick of the specimens from Denmark

There can be little doubt that very fine specimens of arrow-heads, spears and daggers will be found at Rohri when searched for by an expert anthropologist, and I shall be happy to visit the locality if given facilities for so doing

Figures 8, 10, and 12, are typical chert flake knives from Kon They are of the usual type of flint knife Specimen Fig 8 has lost half an inch of its length while in my possession, but is shown in its perfect state in the Plate

A comparison of these specimens with Nos A, B, C, D, Agate* flakes from the rock shelters of South Mirzapore (the Sorhow cave), will at once show their comparatively gigantic size. These Kon flakes are about the same size as the finest of English and Irish specimens It must be here understood that these flakes, though often half the size of the fine specimens from Piesigny, in France, as in the example figured at p. 28 of Evans' "Ancient Stone Implements of Great Britian," Fig 6, have the merit of having their bevels made at a single blow The very large French and English examples have all their ridges trimmed by secondary blows administered at right angles to their length, so as to form the ridge. Nos 8 and 10 come under Evans' definition of flat flakes having had a flake struck off the ridge. No. 3 is a ridged flake and was probably intended to be made into a spear-head. No. 20 is a typical flint knife. Examples of large coarse flakes 10 and 12 inches long, and rivalling the largest European specimen will be seen at Figs. 15, 16, 17 and 18

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* A B C. D are Agate flakes from the Sorhow cave, South Mirzapore, and E is a core from which such flakes are struck They are to be exhibited along with the Kon specimens to show the variation in size and material. No figures of these have been given.

Specimen 14 is a huge flat flake from Kon and is a beautiful specimen of the flint-knapper's art It is so broad and flat that, it was probably used as a celt mounted in a handle. The specimen has seemingly lost about half its length, being fractured across its length It is represented in Fig 23 It is well worth figuring in outline and section, as, I believe, but few like it in width have ever been found in any part of the world

Fig 20, is, I take it, a javelin head, and I saw specimens in obsidian precisely like it from New Caledonia, in the Calcutta Exhibition of 1883-84. They were mounted in short handles, cemented to the shaft with some resinous material A very similar specimen from the Admiralty Islands, is figured by Heape ("Album of the Pacific Islands," Plate 361, Fig 2) The specimen bears very distinct traces of notching at the base so as to adapt it to a socket, and there can be no doubt whatever as to the use to which it was intended to be put

No VII is an arrow-head from Kon, and is a very fine specimen of its class There is a peculiarity about the head that would in itself impart a rotary motion to an arrow I have in my possession a modern iron arrow-head* which I procured from a Baiga in Mirzapore, in which this peculiarity is intentionally reproduced. This is the now well-known principle on which the head of the Kaffir assagai is formed, and it has the effect of causing perfect rotation, so much so, that the slender shaft of an assagai in flight has an undulating spiral movement The concavity and convexity of the flint arrow-head from Kon are not very apparent in the specimen itself, though quite sufficient, in my opinion, to give the desired rotary motion It is very well marked in specimen No VIII† looked at endwise, either point first, or butt-end towards the eye. In either case the form of the bend of a screw is clearly discernible in a well-marked sloping curve. This form is clearly due to the peculiar conchoidal fracture of flint and chert, the convexity being on one side of the bulb of percussion which is well marked, and the concavity on the other. These curves seem to have been prolonged along the entire length of the fracture. There can be no doubt that our iron implements, such as hammers, daggers and spear-heads, are copies of previous forms in stone, and this theory on the form of the arrow-head is by no means far-fetched, and is further capable of demonstration by experiment, *viz.*, mounting the arrow-head on a shaft and firing it from a bow (on soft ground), with a thread attached loose along the shaft, tied behind the arrow-head—a spiral motion communicated to the arrow would have the effect of winding the thread round the shaft As to the beauty of some of the ancient models of stone implements, I may mention that I am now having reproduced in steel, a hammer on the pattern of that figured at page 187 of Evans' "Ancient Stone Implements of Great Britain," Fig 137 I have never seen a modern iron hammer come up to this for elegance or utility of design.

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* I should mention that the Baiga disclaimed any knowledge of the effects of this curve, and, indeed, stated that he had found the arrow head in the jungles, and as it is somewhat rusted, it may be a century or so old, and represent a lost art The arrow, moreover, was strongly feathered with the chestnut primary feathers of the peacock, and it occurred to me that the spiral imparted by these might be antagonistic to the spiral of the arrow-head, but I found that the feathers were so attached at the end, near the notch, that the passage of the arrow through the air caused the three feathers to dispose themselves in a spiral round the shaft I have constantly seen a savage straighten these feathers after picking up the arrow

The Zulu Kaffirs do not seem to be generally aware of the properties of the assagai heads they use, and it is doubtful if the average volunteer rifleman could reproduce or explain the principle of the rifling in his weapon

† VIII Found at the mouth of the Gopit Godowle cave, in the Purwa Jagir, Banda [These Roman numbers and others not agreeing with figures in the plates probably refer to specimens in the writer's own collection —Ed Part III]

The last specimen to be described is shown in Plate IV, Fig. 11 This implement is believed to be of a type never before found in India, and is, I am inclined to think, a spear or rather halberd-head The material of which it is made well exemplifies the characteristics of chert as distinguished from flint, the nearest approach to flint being in No 8 of the collection The chert of which the halberd-head is made shows on its weathered surface numerous black crystaline bodies with the appearance of specks and dashes, no doubt due to the presence of some foreign mineral.

This implement though rudely made and approaching the palæolithic specimens in material and roughness of manufacture, yet bears evidence of design A somewhat similar implement from Honduras is in the Blackmore Museum, Salisbury, and is figured by Stevens in "Flint Chips."

It is of very much ruder construction, and, possibly, the supplementary conical blade was a part of the stone from which the implement was made, and instead of being trimmed off by chipping was utilized as an additional part of the weapon However, when it is recollected how important a part projecting spikes play in the war-clubs of savages, notably among the North American Indians, it will at once be seen that this implement mounted in a short stout handle, could be used both for thrusting, and as a club. The projecting spike, in a downward blow, would act with most deadly effect on the cranium of an adversary.

In concluding this paper I would like to draw the attention of travellers to the very fine field for pre-historic research that exists in this part of India. All along the Southern border of the Gangetic valley in the older alluvium fringing the Vindhians and Kymores and as far south of those hills as I have been in Sergoojah and Rurah, the soil teems with fragmentary remains of ancient stone weapons. I have picked up as many as 50 perfect chert knives and two broken celts in a cotton field within 500 yards of my bungalow at Banda, and do not remember ever having gone out on a search for implements to return unrewarded. In this branch of archæology India is almost an unexplored country considering the abundance of the materials. Mr. A. C. L. Carlleyb of the Archæological Survey, made a very fine collection of stone implements in Bundelkhand, but apparently has not yet published on the subject and his collection is in England. He has ample materials for a volume on the subject.

EXPLANATION OF PLATES IV, V and VI.

Plate IV.

Fig. I. Waste chip or spall of quartzite struck in the manufacture of a Palæolithic celt—Loc. Hinouteo, S. Mirzapore.

Figs. 2, 3, 4 and 6. Discoidal implements of chert from Kon.
Figs. 5 to 7. Pointed flakes of chert, Kon.
Figs. 9-10. Large flake knives of black chert, Kon.
Fig. 11. Stone halberd head of chert.
Figs. 12, 14. Large flakes of chert.

Pl. V.

Fig. 15. Large flake of chert.
Fig. 16. Stone chert like the New Zealand Merai.
Figs. 17, 18 and 19. Large sized flakes of chert.
Fig. 20. Javelin head of chert.
Fig. 21. Chert celt from the Kon ravines.
Fig. 22. Broken ring-stone of chert, Kon.
Figs. 23, 24 and 25. Oblong celts of polished diorite, Kon.

Pl. VI.

Figs. 26 to 36. Three-quarter edge view of chert celts from Kon.
Figs. 37, 38, 39, and 40. Polished oblong celts of diorite from the Kon ravines.
Fig. 41. Broken polished celt of black basalt with squared sides.
Fig. 42. Small oblong celt of green quartz; Kon.

Fig. 43. Large flat stone knife of pink Tirhowan cherty limestone.—Loc., Chopan.

The Muhammadans of Eastern Bengal *Communicated by the* ANTHROPOLOGICAL SECRETARY, *from the papers of the late* DR JAMES WISE

THE most interesting fact revealed by the census of 1872 was the enormous host of Muhammadans resident in Lower Bengal—not massed around the old capitals, but in the alluvial plains of the Delta In Dacca, for instance, the Muhammadans were very slightly in excess of the Hindus, in Maldah they formed 46 per cent of the population, in Murshídábád 45 per cent, and in Patna only 12 per cent On the other hand, in the swampy tracts of Báqirganj, Tipperah, and Mymensingh they comprised nearly 54 per cent of the people This result was unexpected, and contrary to the conclusions arrived at from earlier inquiries, which, though obviously defective, were generally accepted as almost correct

The history of the spread of the Muhammadan faith in Lower and Eastern Bengal is a subject of such vast importance at the present day as to merit a careful and minute examination

The farther we advance in our knowledge of the early history of Bengal the more certain is it, that previous to the eighteenth century the Hindu inhabitants of Bengal far exceeded the Muhammadan in numbers, and as late as the sixteenth century three of the five Bhúyas, or leaders, of Lower Bengal, were Hindu chiefs commanding Hindu armies

The enthusiastic soldiers, who, in the thirteenth and fourteenth centuries, spread the faith of Islám among the timid races of Bengal, made forcible conversions by the sword, and, penetrating the dense forests of the Eastern frontier, planted the crescent in the villages of Silhet Tradition still preserves the names of Ádam Shahíd, Sháh Jalál Mujarrad, and Kárfarmá Çáhib, as three of the most successful of these enthusiasts

As early as A D 1338 a Muhammadan king ruled over the Eastern districts from Sunnárgaon, and for a century and a half that city was the provisional residence of the rulers of Bengal Although situated on the borders of the Empire, and surrounded by brave and aggressive races, Sunnárgaon attracted crowds of holy men, whose mouldering tombs still mark the site of the ancient city From it was summoned the preceptor, who trained Jaláluddín in the doctrines of his intolerant creed, and to its families of Khwánd-Kárs, Eastern Bengal looked for its supply of Muhammadan instructors During the five centuries and a half of Muhammadan rule in Eastern Bengal, we only hear of one wholesale persecution of the subject Hindus, and that was waged by Jaláluddín, from A D 1414 to 1430 The only conditions he offered were the Korán, or death, and it is said that, rather than submit to such terms, many Hindus fled to Kámrúp, and the jungles of Assam and Kachhár, but it is nevertheless probable that more Muhammadans were added to Islám during these seventeen years than in the next three hundred

In Muhammadan histories no mention is made of any large Muhammadan immigration from Upper India, and we know that in the reign of Akbar the climate of Bengal was considered so uncongenial to the Mughal invaders, that an order to proceed thither was regarded as a sentence of banishment The Viceroys and nobles governing Bengal amassed wealth rapidly, and returned to spend it in the luxurious palaces of Delhi and Agra, while only a few officers and private soldiers, having married into native families, remained and settled in their new homes While, therefore, each seat of government, and each military station, was in early times more or less a centre of missionary agitation, we find another agency from across the seas working towards the same ends, uninfluenced by the policy of the Delhi Court On the south-eastern frontier of Bengal, a hardy and enterprising class of Muhammadans have been settled from the earliest historical times, and long before the first European landed at Chittagong, Arab merchants carried on an extensive and lucrative trade with its inhabitants, and disseminated their religious ideas among the people How or when the dwellers on that coast became Mussulmán is unknown,[1] but when Barbosa visited Bengal at the beginning of the sixteenth century, he found the inhabitants of the interior, Gentiles, subject to the King of Bengal, who was a Moor, while the seaports were inhabited by Moors and Gentiles. He also met with many foreigners, both Arabs, Persians, Abyssinians, and Indians, and adds, "Every day many Gentiles turn Moors, to obtain the favour of the king and governors "[2] Cæsar Frederick,[3] and Vincent Le Blanc,[4] who were in Bengal about 1570, also inform us that the island of Sondíp was then inhabited by Moors In the sixteenth century, therefore, Chittagong was a centre from which an unceasing propagandism was carried on

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[1] The people of Chittagong, however, ascribe their conversion to an invasion of their country by Nuçrat Sháh in the sixteenth century —" J A S of Calcutta,' No 4, 1872, p 338

[2] A description of the coasts of East Africa and Malabar, Hackluyt Society, 1866.

[3] " Hackluyt's Navigations," ii, 213–241

[4] " Les Voyages fameux du Sieur Vincent Le Blanc," p 273

Wherever Muhammadan rule existed, slavery was developed, and during the centuries of misrule and oppression, through which Bengal passed, slavery was accepted by the Hindus as a refuge for their troubles. Bengal has for its encouragement of slavery always possessed an unenviable notoriety, and the Delhi Court obtained not only its slaves, but also its eunuchs, from the villages of Eastern Bengal. The incursions of Assamese, and Mags, the famines, pestilences, and civil wars impoverished and hardened the people, and drove them in sheer desperation to sell their children as Mussulmán slaves. The treatment of these slaves was humane, and their position comparatively a good one, as they were allowed to marry, and their families, supported by the master, added to the number of Islám.

Stories of forcible conversion, such as the following, are however narrated by the Muhammadans themselves, without any feelings of shame, or astonishment. While the Muhammadan population was still scattered, it was customary for each householder to hang an earthen water-pot (badhná) from his thatched roof, as a sign of his religious belief. One day a Maulaví, after some years' absence, went to visit a disciple, who lived in the centre of a Hindu village, but could not find the "badhná" On inquiry he was told that the Mussulmán villager had renounced his faith, and joined an outcast tribe On his return to the city, the circumstances being reported to the Nawáb, a detachment of troops was ordered out, the village surrounded, and every person in it compelled to become Muhammadan

Another class of Hindus voluntarily turned Muhammadans, as the only means of escaping punishment for murder, or adultery, as this step was considered full atonement for either crime [1]

In later times this compulsory system was still farther extended The tyrannical Murshíd Julí Khán enforced a law that any Amal, or Zamíndár, failing to pay the revenue that was due, or being unable to make good the loss, should with his wife and children be compelled to become Muhammadans [2] Furthermore, it was the common law that any Hindu forfeiting his caste by a breach of regulations could only be reinstated by the Muhammadan Government, and, if it refused to interfere, the delinquent remained an outcast, ultimately taking shelter in the ranks of the Faithful The same right was at first claimed by the English Government, but in 1769 it was abandoned, "there being no longer the necessity of publicly asserting the subordination of Hindus to Muhammadans." [3]

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[1] "Bernier," vol. i, 144 "Voyages de Le Goowz," p 157

[2] Gladwin's Narrative, quoted in "Harington's Analysis," iii, 274

[3] Proceedings of Fort William Select Committee, dated August 16th, 1769

As late as 1791, Dr. Robertson maintained that the Muhammadans of India were "the descendants of adventurers, who have been pouring in from Tartary, Persia, and Arabia ever since the invasion of Mahmúd of Ghazní, A D 1002."[1]

When English magistrates first came in contact with the people of Bengal, they arrived at the conclusion that the Muhammadans only comprised one per cent of the population,[2] and this estimate, formed on very insufficient ground, was generally assumed to be approximately correct

In 1830 the first census of the city of Dacca was taken by Mr H. Walters, who estimated the native population at 66,667, of whom 35,238 were Muhammadans, 31,429 Hindus[3] Even as late as 1839, Mr. Taylor asserts[4] that the population of the district consists of Hindus and Muhammadans in nearly equal proportions, but in the city the latter constitute the principal portion of the inhabitants, their numbers, in 1838, exceeding that of the Hindus to the extent of 4,309, in a population of 60,617. The Revenue Survey, again,[5] as the result of their inquiries, arrived at the conclusion that the population of the Dacca district, between 1857 and 1860, consisted of—

Hindus	...	455,182
Muhammadans	..	449,223
Christians	...	210
	Total ..	904,615

These estimates, often wonderfully correct, indicate the general conviction, up to the taking of the census of the whole of Bengal in 1872, when it was discovered for the first time that, in Lower Bengal alone, there were 17,608,730 Muhammadans, of whom 7,948,152, or 45 per cent, resided in the nine Eastern districts, while the total number of Hindus in the same province was 18,100,438 The Muhammadan element was, moreover, found to be strongest in Báqirganj (1,540,965), Mymensingh (1,519,635), Dacca (1,050,131), and Tipperah (993,564)

In the Dacca district, the Hindus only numbered 793,789, or 43 3 per cent. of the whole population; while in the city of Dacca the population was 34,433 Hindus, to 34,275 Muhammadans.

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[1] An historical disquisition concerning Ancient India in Robertson's Works, ii, 346

[2] "Alexander Hamilton," ii, 25 "Luke Scrafton," in "Asiatic Annual Register," ii, 20 Governor Verelst, however, asserts "that eight out of ten were Gentoos"

[3] "Asiatic Researches," vol xvii, 536

[4] "Topography of Dacca," p 243

[5] "Principal heads of the History and Statistics of the Dacca Division," Calcutta, 1868.

These figures all point to the conclusion that it is to a change of religion, and not to the immigration of any Muhammadan race, that the existing predominance of the Mussulmán element in Eastern Bengal is due While the proportion of Muhammadans in Hindustan and Bihár is comparatively low, it has in Bengal gone on increasing, until it has reached its present surprising height, and there is no present appearance of its diminishing

The reasons which forced many Hindus to turn renegades, during the Muhammadan rule, have been specified, but as most of these influences have disappeared under English law we must look to other motives, still prompting the Hindu to change his belief The most potent influence undoubtedly at the present day is the attraction of Islám itself Bengal was never properly an Aryan country, and the Aryans who did reside within its borders always held an uncertain footing among the aboriginal tribes, driven down the Gangetic valley by the conquering races of Hindustan The Hindu priesthood was therefore forced to adopt the deities of its neighbours, and to blend the more elevated religion of the Vedas with the barbarous rites of the indigenes Nowhere was Hinduism so debased, and so corrupt, and nowhere have the masses who held aloof been treated with greater contumely and inhumanity

When the Muhammadan armies poured into Bengal, it is hard to believe that they were not welcomed by the hewers of wood and drawers of water, and that many a despairing Chandal and Kaibartta joyfully embraced a religion that proclaimed the equality of all men, and which was the religion of the race, keeping in subjection their former oppressors Hinduism had prohibited the outcast from residing in the same village as the twice-born Bráhman, had forced him to perform the most menial and repulsive occupations, and had virtually treated him as an animal undeserving of any pity, but Islám announced that the poor, as well as the rich, the slave and his master, the peasant and the prince were of equal value in the eyes of God Above all, the Bráhman held out no hopes of a future world to the most virtuous helot, while the Mulla not only proffered assurances of felicity in this world, but of an indefeasible inheritance in the next

Such appear to be the main reasons for concluding that the Bengal Muhammadan of the present day is a converted Hindu, and not a scion of any Mughal or Pathán stock, but farther, if we examine a crowd of Bengali villagers at the present day, one, and only one, type of features, of complexion and of physique pervades them all, and it is impossible for the most practised observer, setting aside the different styles of dress, the beards, and the hair, to distinguish between a Muhammadan and a

Hindu peasant. A careful examination of fifty Muhammadans and fifty Hindus, selected indiscriminately from convicts of the Dacca jail, gives the following averages —

	Muhammadans.	Hindus.
Average age	33½ years	32¾ years.
Height	5 feet 3½ inches	5 feet 4 inches
Weight	7 stone 10 lbs. ...	7 stone 10 lbs.
Girth of chest	31 inches	32 inches

Although the Muhammadan religion has spread and is still spreading, among the low Hindu castes of Eastern Bengal, it is not to be inferred that the Muhammadans are an united body, as is generally assumed, without any divisions, or internal dissensions. It would, for instance, be impossible for the Arab to connect the corrupt Hinduised rites he witnesses in Bengal with those celebrated at Mecca, or to discern in the veneration of Pírs any relation to the orthodox faith.

Until the beginning of the nineteenth century the only great divisions of the Indian Mussulmáns were the Sunní and Shíah, the former predominating, sustained by the royal families of Delhí, Haiderábád, Tonk, and Bhopál, the latter upheld by the dynasties of Golcondah, Lucknow, Murshídábád, and the Nawábs of Dacca.

The Shíah supremacy, lost during the anarchy of the eighteenth century, has never been regained, but the Sunní has gone on increasing, not as one harmonious whole, but by separation into rival, though mutually tolerant, sects. At the present day four sects, differing in many important particulars, especially in their sentiments regarding Christianity, disunite the Muhammadan population of Eastern Bengal.

These sects are the following —

1. Sábiqí, who may be called the conservatives of the debased Hinduised religion peculiar to the lower orders of Muhammadans in Eastern Bengal. The majority of the landholders, and, with few exceptions, the descendants of the old Sunní families, belong to it.
2. Farazí, or those following the Fraz, or divine command. Sharí'attullah and his son Dudhu Miyán founded this, the most uncompromising sect of Sunnís, who, differing though little from the Wahábbí, repudiate that name and refuse to pray standing behind a person belonging to the first or third sect, or even to eat and drink with them.
3. Ta'aiyuní—from the Arabic Ta'aiyun, establishing, or manifesting, or Ráhí, from the Persian for a traveller—are the followers of Maulaví Karámat 'Alí and the Patna school, comprising the vast majority of the Dacca cultivators, thatchers, and hide merchants.

4. Rafi'-yadain, so called from their elevating their hands to the ears, each time that the words Alláh Akbar are pronounced in the course of prayer, while all the other sects only do so at the beginning of the invocation. They also fold their arms across the chest when praying instead of over the navel; and at the end of each supplication call out in a loud tone of voice Ámín, or Amen They are the real Wahábbís of Eastern Bengal, and are said to be already more numerous than the Sábiqí Many of the most enterprising and prosperous traders belong to this puritanical body

The first, or Sábiqí, sect is in some respects the most interesting. It is the oldest, the most corrupt, and, until late years, it represented the dominant state religion By a study of its heresies and superstitions we acquire a truer estimate of the paralysis that penetrated throughout the Muhammadan faith in Bengal, when the revival of the present day first dawned upon the people

In no other country have the Muhammadans embodied so many infidel rites and customs with their own creed as in India, and M Garcin de Tassy, in his interesting Memoir,[1] refers this to the too great simplicity of Islám for a country where an idolatrous and allegorical religion, appealing to the senses and imagination more than to the mind and heart, was prevalent But, perhaps, the causes that corrupted the Hindu religion, namely, contact with alien and despised races, each having a peculiar cultus of its own, isolation from the cradle and centre of its authority, and the paucity of numbers as compared with the millions of unbelievers around them, also tended in the case of the Muhammadans to produce greater liberality of feeling and more sympathy for the sentiments and religious observances of the aboriginal races The local gods, the gods whom men sought after in times of trouble and sickness, were too near and dear to the inmost heart of the Hindu convert to be abolished without substitutes. It was much easier to give them an anthropomorphous form and to replace them by saints endowed with equal powers and with spirits of as easy access to the worshippers

Whether one, or all of these causes combined, created the tolerant spirit, there is no doubt that with a few glaring exceptions, the Muhammadan rulers of India have been, during the last three hundred years, on the whole remarkable for their freedom from bigotry, and for their forbearance to the other religions of the peninsula Sikandar Lodí (1488–1516), the last persecutor of the Hindus, destroyed the holy shrines of Mathurá, and strictly prohibited the Hindus from shaving their heads or beards, from performing their regular ablutions, and from worshipping Sítalá, the goddess of small-pox.[1] It is to the enlightened Akbar that the tolerant policy of the Mughal dynasty is to be referred. He paid adoration in public to the sun and to fire in 1580; and on the full moon of Srávan employed Brahmans to fasten the "rakhí" on his wrists.[2] He, and his courtiers, married Hindu wives, and the name of Muhammad, though one of his own, was repudiated by the emperor.

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[1] "Memoire sur les Particularités de la Religion Musulmane dans l'Inde," p. 9

His son, Jahángír, was a still more indifferent Muhammadan. During his reign the Díwalí Pújah was kept, and cows were paraded in the royal gardens, while on the Sívarátrí, Jogis were invited to the palace, and the emperor ate with them. Moreover, in the eighth year of his reign, he celebrated his father's Sráddha in the mausoleum at Sikandrah, and the Muhammadan festivals, with the exception of the Shab-i-barát, being no longer observed, Parsí feasts were held instead, and seven out of eight of Akbar's grandsons received Parsí names.[3]

Dárá Shikoh, the eldest son of Sháh Jahán, was upbraided by his brother Aurangzib for not having even the resemblance of a Mussulmán, and for composing a work, called Majmá-ul-bahrain, or the meeting of the two seas, having for its object the union of the Hindu and Muhammadan religious systems.

It is a well known fact that most Indian Muhammadans depreciate the founder of their religion, and exalt the two martyred sons of 'Ali above him, and his immediate successors in the Khálifate.

The annual Muhammadan fast, again, is properly a Shíah ceremony, its observance and the preparation of Tázias, or models of the tombs of the two martyrs, Hasan and Husain, being prohibited by Sunní doctors. In reality there are only two great festivals enjoined by the Koran, namely, the Íd-ul-fitr at the end of the month of Ramazán, and the Íd-ul-Qurbán, or Baqr-íd, as it is popularly called, on the tenth of Zihiffa, the last month of the year.

The preparation of Tázias, until late years, was carried on in every Muhammadan village, and each strove to make a more gaudy model than its neighbour. Hindu Zamíndárs subscribed towards its expense as the Muhammadan landlords did to the Durgá image, and, as M. de Tassy points out, many peculiarities of the one festival resemble those of the other. Both last ten days, and on the 'Ashúra, or Manzil-ka-din, of the Muharram, and on the Vijayá-dasamí of the Durgá Pújah, the biers, and the images of Durgá, are thrown into a river, or tank. In some respects, however, the procession of Tázias also resembles the Rath

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[1] Elliott's "History of India," vol iv, 447, 448.

[2] "'Aín-i-Akbari" (Blochmann's Translation), i, 184.

[3] "Calcutta Review," October 1869.

Játtrá of the Hindus, and at both the greatest merit is attributed to the persons dragging the car In Dacca there is a peculiar similarity between the two. In former days one Níl Bahr built a cenotaph in honour of Bíbí Fátimah, and for many generations a paper Tázia, called Turbat Haidarí, has been deposited in it during the Muharram On the night of the tenth day the oldest and most venerable man sleeps in the building. A Parí reveals to him the exact hour that the Tázia should be removed, and as that hour approaches it is placed on a platform, or gaddí Níl Bahr, and crowds of Muhammadans assemble and struggle for the honourable post of carrier. When it has once started it must not be put down until the tank, where it is finally cast away, distant four miles, is reached During the year the lower orders are in the habit of vowing that if their wishes are fulfilled, they will assist in carrying the Turbat, and at the Rauza, or cenotaph, crowds resort on the 'Ashúra day with offerings of pigeons, sweetmeats, and solah chaplets (sihrá)

Another peculiarity of the Indian Muharram is that two biers are represented, while in Persia only one, that of Husain, was formerly carried in procession Again, Bengali Muhammadans believe that the two sons of 'Ali became martyrs on the same day, and that the great fast is held in honour of them both, although they actually died in different months at an interval of ten years [1]

In India the Bárah-wafát, or anniversary of the death of Muhammad, is observed by the Sunnís, on the twelfth of Rabiá-ul-awal, while in Turkey, Egypt, and formerly at Akbar's Court,[2] that day is celebrated as the anniversary of the "Maulid," or birth of the Prophet [3]

In some parts of India, *especially in the neighbourhood of Muhammadan cities*, there is a mosque, known as the Qadam Rasúl, where a foot-print of the Prophet is carefully preserved. On the banks of the Lakhya, a few miles east of Dacca, is a very celebrated place of pilgrimage, built on a lofty mound, apparently the site of an old fort At this mosque is kept a large slab of dark slate, fashioned into the shape of a foot-print, which is exhibited to any pilgrim on the payment of a fee to the custodian In the same way as the Gayáwál Bráhman earns a livelihood by showing the Vishnupad, the Mutawallí gains his by imposing upon the credulous and ignorant villager. Veneration is paid to hairs, gravely stated to have once belonged to the Prophet's beard, or moustache; and on the capture of Delhi, in 1857 not the least valuable articles of prize were a few hairs which had been preserved as relics in the Jamá Masjid of that city.

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[1] Hasan was poisoned at Madínah, 28th Cafar, A H. 50 (670), Husain was killed at Karbaláh, 10th Muharram, A. H. 61 (680).

[2] Elliott's "History of India," v 412

[3] Muhammadans agree that Muhammad was born and died on the same day of the month —"Calcutta Review," xxii, 366

What, however, chiefly distinguishes the Indian Muhammadan from his brethren of other lands is his servile veneration for Pírs, or holy men. The diptych of Indian saints is very voluminous, and each province of India, nay, every district and city, has its own patron saint. In Eastern Bengal they amount to a considerable number, the most famous being the following:—

Sháh Jalál Mujarrad Yamaní of Ṣilhet[1]
Pánch Pír
Munná Sháh Darwísh } of Ṣunnárgaon[2]
Khúndkár Muhammad Yúsuf
Sháh 'Alí Bághdádí of Mírpúr.
Pír Badr Auliyá of Chittagong
Sháh Jalál Dakhiní of Dacca.
Ádam Shahíd of Bikrampúr.

The dargáhs, or shrines, of these holy men are annually visited by hundreds of pilgrims, both Muhammadans and Hindus, who often undergo as much exposure and fatigue in reaching them as the strict Hindus on their pilgrimages to the sacred places of Jagannáth, or Brindában.

The "Qanoon-i-Islám"[3] gives a list of the Muhammadan saints of India, but only one belongs to Bengal. The names and lives of four others are recorded in Mr. Blochmann's invaluable "Contributions."[4] The celebrity, however, of those of Bengal pales before that of Faríd Shakarganj, Qutbuddín, and Nizámuddin of Delhi, the three most famous saints of Hindustan.

The veneration paid by the Indian Mussulmán to his Pír, equals, if it does not exceed, that paid by the Hindu to his Guru or Gosain. The former implicitly believes in his miraculous powers; in his ability to cure diseases, to make the sterile woman conceive, and, as in the case of Sháh Karím 'Alí, of Jagannáthpúr, in Tipperah, to raise from the dead, and to cause rain to fall when and where he pleases. Muhammadans, even the most intelligent, accept such stories without hesitation. According to them there is no antecedent improbability in a human being exercising powers which are generally considered to belong to God alone. There are three kinds of Pírs recognised: the Pír tariqát, the Pír haqíqát, and the Pír ma'rifat, who fulfil certain mystical duties towards the individual; but the term has also a wider signification, being often applied to a departed spirit, and even to any old and venerable person. A Pír, likewise, may be ancestral (Jaddí), or inherited (Khalafí)

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[1] "J. A. S. of Bengal," part i, No. 3, 1873.
[2] "J. A. S. of Bengal," part i, No. 1, 1874.
[3] Pages 432–6.
[4] "J. A. S. of Bengal," part i, No. 3, 1873.

In India it is customary for a disciple on approaching his Pír to make the obeisance Sijdah, touching the ground with the forehead, or the still more obsequious, Taslím, or Kornish, actions censured as most culpable by the Arabs and foreign Muhammadans generally.

From the earliest ages of Muhammad, retirement from the world, self-abstraction, and contemplation, were habitually followed in the certain belief that thereby complete authority over the powers of Nature would be attained. Hindu philosophy had much to say to the creation of Muhammadan hermits, but it is probable also, that the example of the Ráhib, or Christian anchorites, who retired into the desert before the army of Khálid bin Walíd, prompted men to follow in their footsteps.

Not satisfied, however, with these innovations, the Indian Muhammadans have superadded the worship of certain mythical personages around whom have collected various traditions and romances. The following list includes the most important, as well as most popular, of these immortals.

1. *Khwájah Khizr*

Who this person was, is still a subject of dispute among Muhammadans. The eighteenth chapter of the Koran describes the expedition of Moses and Joshua in search of Al Khedr, called *Zúlqarnain*, a title by which Alexander the Great is known all over the East, hence it is inferred that Khwajah Khizr is no other than Alexander Most commentators, however, identify him with Elias, or Elijah, who, having drunk of the water of life (áb-i-hayát), never tasted of death, and Mr Deutsch informs us[1] that in the Talmud, Elijah appears as a kind of immortal tutelary genius, who goes about in the garb of an Arab. Others affirm that he was the companion, counsellor, and commander-in-chief of the armies of Zúlqarnain, or Kaikobad, but in Asia Minor Khizr Elias is a name of St. George of Cappadocia[2]

Whoever he was, Kwájah Khizr is believed at the present day to reside in the seas and rivers of India, protecting mariners from shipwreck, and to be only visible to those who accomplish a forty days' watch on the banks of a river.[1] Muhammadans of all ranks make vows to him in seasons of sickness, or trouble, and present offerings in acknowledgment of any blessing, such as the birth of a son, attributed to his intercession

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[1] "Quarterly Review." October, 1869.

[2] The legends about Khizr are not unknown to Western literature. To them we owe the beautiful poem of "The Hermit," by Parnell, and the tale of "L'Ermite" in Voltaire's "Zadig" It is supposed that the story of Khizr in the Koran was brought to Europe by the Crusaders, was embalmed in the folk-lore of the West, until quickened by the pen of genius, and graced with the charms of an apologue, or moral tale

The festival of the Berá, or raft, is properly observed on the last Thursday of the Muhammadan year, but in Bengal it is held on the last Thursday of the Hindu month Bhádon (Aug.-Sept.), which corresponds with the breaking up of the rains. The festival is kept by Hindus, especially by boatmen and fishermen, as well as by Muhammadans The Berá, usually made of paper, ornamented with tinsel, has a prow resembling a female face, with the crest and breast of a peacock, in imitation of the figure-head on the bow of the '*Mor-pankhí*' pleasure-boat. The effigy placed on a raft of plantain stems is set afloat at sunset, and with its flickering lights gives a picturesque aspect to the dark and flooded stream At Murshídábád, where the festival was first kept by Siráj-ud-daulah,[2] the Bagarathí is illuminated by hundreds of rafts floating with the stream, while the banks are crowded by the inhabitants[3] It is the custom for the person launching a Berá, to deposit on the bank a few slices of ginger, a little rice, and two or three plantains, which are usually snatched up by some wretched beggar.

Whether or no the modern idea of peopling the waters with deathless spirits was derived from the ancient Persians, or Hindus, it harmonized so well with the prepossessions of the Muhammadans as to be adopted without hesitation as a religious conception It is, however, impossible with our present knowledge to explain why Khwájah Khizr, who is not regarded by other Oriental people as the guardian spirit of the waters, should have been selected as such in the Gangetic Valley, more especially as in various parts of the Muhammadan world other fabulous persons are adopted by sea-faring races 'Abdul-Qádir Gilání and Abú-Zulaimah[4] control portions of the Eastern Seas, while a female spirit, Máma Salmá, presides over the ocean beating against the cliffs of Rás Mosandim, at the entrance of the Persian Gulf, and Indian mariners sailing past propitiate her by offerings of cocoanuts, fruits, and flowers.[5]

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[1] The person who is favoured in this way usually adopts the trade of a water-carrier (bihistí).

[2] "Siyar-ul-Mutakherin," translated by Hájí Muçtafa, ii, 533

[3] A picture of this scene is given in Hodge's "Travels in India during the years 1780-83" (London, 1793)

[4] "Pilgrimage to El Medinah and Meccah," i, 194

[5] "A Journey through Persia," by James Morier, p. 86

On the Coromandel coast, again, Qádir Walí Çáhib is the patron saint of sailors,[1] as Shaikh 'Ali Haidarí was at Cambay in the fourteenth century,[2] and Abu Ishaq al Kázrúní at Shíráz.

2 *Zindah Ghází.*

It is difficult to determine whether or not Zindah Ghází, Ghází Miyán, and the Sat Pír, are the same or different individuals, but there is a striking similarity in the fables appertaining to each. The woodcutters in all parts of the Sunderbuns invoke certain mythical beings to protect them from tigers and crocodiles. In the twenty-four Pergunnahs it is Mubarrá Ghází, in the eastern parts of the Delta it is Zindah Ghází, the immortal warrior, while by Hindu workmen it is Kalú-ráya, or Śiv, riding on a tiger, holding in his right hand an arrow, in his left a bow.[3] Mubarrá Ghází is said to have been a faqír, who reclaimed the jungly tracts along the left bank of the river Huglí, and each village has an altar dedicated to him No one will enter the forest, and no crew will sail through the district, without first of all making offerings at one of the shrines. The faqírs residing in these pestilential forests, claiming to be lineally descended from the Ghází, indicate with pieces of wood, called *Sang*, the exact limits within which the forest is to be cut [4]

Zindah Ghází, according to the legend, came to Bengal when Rájah Matak ruled over the Sunderbuns. He had a dispute with the monarch, who, convinced of being in the right, vowed to give his only daughter Shushila in marriage to him on its being shown that his, the Rájah's, opinion was wrong This the Ghází did, and won his bride As no man saw him die, he is believed to reside in the depths of the forest, to ride about on tigers, and to keep them so subservient to his will that they dare not touch a human being without his express commands. Before entering a jungle, or punting through the narrow channels, whose shady banks are infested by tigers, boatmen and woodcutters, both Hindus and Muhammadans, raise little mounds of earth and make offerings on them of rice, plantains and sweetmeats to Zindah Ghází, after which they fearlessly cut brushwood and linger in the most dangerous spots.

In Dacca there is a popular band of musicians known as Zindah Sháh Ghází ká gáyan, who recite songs in honour of the Ghází, and from whom the above particulars were obtained.

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[1] "Qanoon-i-Islám," p 243

[2] "Travels of Ibn Batuta" (Lee), p. 146, 43

[3] Ward's "Hindus," iii, 186.

[4] "Statistical and Geographical Report of the Twenty-four Pergunnahs District," by Major R Smyth, 1857. *Sang* is the Sanskrit for union, and the pegs of wood, signify identity with the Ghází.

This strange myth, there cannot be any doubt, is merely the Hindu Kálú ráya, converted into a Muhammadan immortal to suit the taste of the superstitious boatmen.

3. *Pír Badr.*

Besides Kwájah Khizr, Bengal supplies other animistic ideas regarding water, and Pír Badr shares with him the dominion of the rivers. This spirit is invoked by every sailor and fisherman, when starting on a cruise, or when overtaken by a squall or storm. All Muhammadans agree that he resided at Chittagong, but his history does not disclose the reason why the attributes of a water-demon were conferred on him. According to one account he was a shipwrecked Portuguese sailor, named "Pas Gual Peeris Botheilo," who reached the shore by clinging to a piece of wreck. The guardians of his shrine, however, say that about a hundred and fifty years ago, Pír Badr arrived at Chittagong "floating on a rock," and informed the terror-stricken inhabitants that he had come all the way from Akyab on this novel craft! The neighbourhood of Chittagong being then infested by Jins, or evil spirits, he exterminated them, and took possession of the whole country. The modern Dargáh, or cenotaph, of Pír Badr stands in the centre of Chittagong, and is regarded as the palladium of the city. Faqírs are the custodians, and the mosque with its rooms for pilgrims is kept scrupulously clean. On the walls of the cenotoph are ten niches for ten oil-lamps, which are lighted every evening and burn all night Pilgrims from all parts of Bengal visit the Dargáh in fulfilment of vows, or to obtain the favour and intercession of the saint, while Hindu fishermen regard him with as much awe as the Muhammadans His 'Urs, or festival, is celebrated annually on the twenty-ninth of Ramazán, the anniversary of his death There can, however, be little doubt that Pír Badr is no other than Badr-uddín Badr-i-'Alam, for many years a resident of Chittagong, who died A. H. 844 (1440), and was buried in the Chhotá Dargáh of Bihár, but about whom we possess no further particulars [1]

4. *Ghází Miyán.*

This much more celebrated personage is worshipped by both Hindus and Muhammadans, and his Shádí, or wedding, is a very popular entertainment throughout Hindustan. In the north-western parts of India he is identified with Sálár Mas'úd, the nephew of Mahmúd of Ghazní, who was born at Ajmír A. H. 405 (1014), and after performing prodigies of valour in battle against the infidels, and capturing Delhi and Ayodhya, settled at Bahráich in Oudh. Here he was attacked by the Hindus' under Rái Sahar Deo and Har Deo, and in the battle that ensued he was killed and his army cut to pieces. This occurred on the fourteenth Rajab, A. H. 424 (1033).[1] Around this warrior's name strange and incredible stories have accumulated. It is believed in Oudh that the bones of the hero were only discovered in the fourteenth century, and that whilst being exhumed many miraculous events occurred;[2] but a native historian informs us[3] that Sikandar Lodí, in the fifteenth century, abolished throughout his dominions the annual procession of the spear of Sálár Mas'úd because of its being contrary to orthodox belief. No legislation, however, could stop such a popular holiday as this has always been.

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[1] "J. A. S. of Bengal," Part I, No. 3, p. 302

It is perhaps impossible to explain the meaning of the absurd frolics indulged in throughout India by all classes when celebrating the Shádi of Ghází Miyán. Mr. Wilson[4] identified the Jhandí, or flag, of Shád Madár with the spear of Ghází Miyán, and regards the Persian word "Shádí," used by the vulgar, as a corruption of the Arabic "Sháhidí," or testimony; hence martyrdom, or the death of a Muhammadan in a war with infidels.

In corroboration of this conclusion it is remarkable that at Gasyárí, in the Banda district, a fair is annually held in the month of Baisákh in honour of Ghází Miyán, at which Daffálí faqírs wrap coloured rags and horse-hair at the end of a long bamboo, round which they sing and often burn incense.[5]

In some parts of India the Ghází is spoken of as the son of a famous General serving the King of Delhi, who adopted the garb of a faqír retired from the world, and shortly afterwards died, on which the son, Madár, joined the troops of a Pathán leader, and distinguished himself by his bravery and hatred of the Hindus Hence his name has come to be regarded as the symbol of daring courage, and at the present day is used as a battle-cry by Hindustani troopers While his nuptial ceremonies were being celebrated the enemy appeared, and in an attempt to drive them back he was slain. His death and the removal of the nuptial banners and emblems are supposed to be represented at the popular festival, but Mr. Wilson also sees a resemblance to the marriage ceremonies of the Súdras.

At Bahráich, on the first Sunday of Jeth (May-June), a great fair is held at the tomb of Sálár Mas'úd, when crowds of pilgrims present votive offerings at the shrine. At Munír, near the junction of the Sôn and Ganges, the anniversry of the death of Ghází Miyán is celebrated. The history of this fair is interesting, as showing how legends pass from one holy man to another.

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[1] Elliott's "History of India," vol ii, App 513–49; and "Supplemental Glossary," i, 251.

[2] "Asiatic Annual Register," vi (1804).

[3] "History of India," iv, 448.

[4] "Asiatic Journal," iv, 75.

[5] "Statistical and Descriptive Account of the North-west Provinces of India," i, 118. (Allahabad, 1874).

Van Graaf,[1] sailing up the Ganges in 1669, stopped at "Monera." The inhabitants were poor cultivators, and the country was formerly a desert until a very holy man, "Hia Monera,"[2] struck by the aspect of the place, fixed his abode there, exterminating the wild beasts, and erecting a small chapel where he performed many miracles. At his death he left much money, with which "his valet" built a mosque and a tank, resorted to by faqírs who pretended to work miracles. The mosque still stands, but the faqírs, finding the worship of Ghází Miyán more profitable, have established a fair in his honour instead.

The festival of Ghází Miyán is not popular in Eastern Bengal, but few villages are without a shrine dedicated to Ghází Çáhib. This spot is usually a diminutive Dargáh, with a raised mound of earth in the interior, before which every Muhammadan and Hindú makes obeisance as he passes, and whenever sickness attacks his family, or when the Çáhib's intercession is solicited, the villager makes votive offerings of flowers, milk, and sweetmeats. Along the banks of the Lakhya, on the outskirts of villages, a mound of earth, smeared with cow-dung, stands beneath a grass thatch. This mound has generally two knobs on the top, said to represent the tombs of Ghází Miyán and his younger brother Kálú. On the twenty-second day after a cow has calved the first milk drawn is poured over the mound as a libation, and in times of sickness, rice, plantains, and sweetmeats are offered.

5. *Pánch Pír.*

According to Shakespeare and Forbes, Pánch Píriyá is a term applied to any person who worship the five Pírs of the Mussulmáns; or belongs to a caste of Halál Khors. But, who are the Pírs of the Mussulmáns? No Muhammadan Maulaví in Eastern Bengal can name them, or give any explanation why they are so called. The Pánch Pírs are familiar to every one, being invoked whenever danger threatens; but among Bengali Muhammadans there is no special ceremony, and no festival kept in their honour. Every Muhammadan boatman on unfurling his sail shouts, either—

"Alláh, Nabí, Pánch Pír, Badr, rakhiyá karo!"

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[1] "Voyages de Nikolaas Van Graaf aux Indes Orientales." (Amsterdam, 1719).

[2] This was Shaikh Sharafuddín Yahyá Munírí, a famous Çúfí, who wrote the "Maktúbát Yahyá Munírí," in a series of 250 letters to his disciples. He died about A. D. 1370.

or the following doggrel verses :—

Hamáre achhe pulabán
Ghází achhe nigahbán
Sar Ganga, Pánch Pír, Badr! Badr! Badr!

The great Akbar was denounced, Mr. Blochmann informs me, by some hostile critic for being a Pánch Píriyá, and no Muhammadan, on account of his eclecticism and toleration

Again, in his paper[1] on the ballads and legends of the Punjáb, Major Abbott translates a poem in which the appearance of the Pánch Pír to the legendary hero of the Punjáb (Rasálu) is mentioned, and in a note these five are said to be,

Baḥá-ul-haq,
Sháh Rukn 'Álam,
Sháh Shamsuddín,
Makhdúm Jahániyán,
Faríduddín 'Aṭṭár Shakarganj

The first three are saints peculiar to Multan, the fourth died A. H 785 (1383), and his tomb is at Uch Sharíf,[2] while the fifth, the most famous, died A. D. 1266, and over his remains a tomb was erected by Nizámuddín of Delhi, which still stands, at Pak Patan, between the Bias and Chenab, and is a favourite place of pilgrimage on the fifth of the Muharram.[3] But, as Mr Blochmann points out, these are merely the names of the five most celebrated Muhammadan saints of the Punjáb, and the list affords us no insight into the meaning of the term Pánch Pír as used at the present day.

Sir H Elliot[4] mentions that Ghází Miyán and his bhánjá, or sister's son, Hathili, are regarded by the peasantry of the Doáb, as two of the Pánch Pír, but the names of the remaining three are not given.

In Bengal again, no individuals are mentioned, and the Pánch Pír are collectively invoked as guardian spirits in times of trouble. Amid the forest that has overgrown the old city of Sunnárgáon, is a very holy shrine, called the Pánch Pír, where five unfinished tombs stand, to which Hindús and Muhammadans come from long distances in fulfilment of vows, but no one can tell who the saints were, or whence they came.

It must be borne in mind that the number five has always been regarded by Hindus as a lucky one Five Members form the Pancháít, or native court of arbitration, and the Panchamí, or fifth lunar day, is one of peculiarly good omen. Some such idea may be the origin of this peculiar worship, and the term five may be merely used to signify an indefinite number, as half-a-dozen does in England.

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[1] "J A. S of Bengal," vol xxiii, 159
[2] "Travels of Mohan Láll," p 454. "J A. S, of Bengal," v. 796.
[3] "Mohan Láll," p 376.
[4] "Supplemental Glossary" i, 251–70.

As has been mentioned, Muhammadans invoke the Pánch Pír, but still more strange, Hindus follow their example. All Hindustani Kumhárs and many Nápits, Kándús, Dhobís and Goálás belong to the sect called Pánch Píriyá, which has two subdivisions, or Srení, that neither eat together nor intermarry. The one eats flesh that has been legalised according to Muhammadan (*zabh*), or Hindu (*balí*), law, drinks spirits and follows the Ṣákta ritual on Hindu, the Pánch Píriyá on Muhammadan festivals. The other, the more modern, are followers of Vishnu, eating no animal food, touching no spirits, and never making, pilgrimages to Muhammadan Dargáhs, as the first do.

In Bihár the Pánch Píriyá belonging to the low castes engage a Daffálí faqír to officiate at their religious ceremonies, which consist in the sacrifice of a cock, and the repetition of several prayers. When a disciple is initiated a cock is always sacrificed, and the Neophyte must bake bannocks of wheaten flour and distribute them among the company to avert the wrath of the Pánch Pír

In other respects the worshippers of these saints are Hindus, their Purohit being often a Kanaujiya Bráhman, while the Guru is always the Mahant of the Nának Sháhí Akhárá This connection with the Nának Shahí sect seems to indicate the origin of the Pánch Píriyá Nának Sháh taught universal toleration, and insisted that not only were the essential doctrines of Hinduism and Muhammadanism analogous, but that one Supreme Being, adored as either Harí, or Alláh, was sought after by the devout of both creeds. It was natural that in such a tolerant sect eclectic teachers should spring up, selecting from the ritual of each religion whatever was likely to recommend itself to the vacillation of either party If this be the true origin of the Pánch Píriyá belief, or not, it is beyond a doubt that very many of the lower and least stable classes of native society profess it, although it has failed to make any impression on the higher ranks whose position is secured, and whose spiritual welfare is confided to the Bráhmans

A well-known resident of Eastern Bengal is popularly called the Pánch Píriyá Çáhib, it being said that his parents, losing one child after another, were advised by a favourite servant to consecrate the next to the Pánch Pír, and by so doing preserve him. They followed this advice and were gratified to find their son grow up strong and healthy. Hindus always quote this as an instance of the benefits accruing to those who believe in the Pánch Pír.

6. *Shaikh Sadu*

The worship of Shaikh Sadu, or Míran Jí, is peculiar to India, and, in Bengal, is almost exclusively confined to Muhammadan courtezans.

At Amrohah, a celebrated Sayyid Jagír in Rohilcund, there is a mosque, said to have been built by one 'Ambar in the reign of Kai Kobád, and restored by Sayyid Muhammad, Mír 'Adl, in the sixteenth century. In the thirteenth century Shaikh Çadruddín, whose name has been shortened to Sadu, was Maulaví of this mosque, and famous for the amulets and chains (*gandá*) he bestowed. To this shrine crowds of Hindu and Muhammadan pilgrims resort every Thursday, in the certain belief that by presenting gifts to the custodians, and by hanging on to a chain, the "*Chain of Desire*," all the dearest wishes of their hearts will be attained. Adjoining the shrine are the tombs of his mother 'Áishah, and of a familiar, Zain Khán.

The following story explains the reason why Shaikh Sadu is worshipped by the impure and dissolute nature. While ploughing one day this saintly personage turned up a lamp, designed by a great magician, which as soon as it was lighted caused four genii to appear. The Shaikh, a very immoral man, employed these genii as pimps, but having debauched a girl, they put him to death. After death he became a jin, but he still revisits this world and reveals to men, more often to women, a knowledge of futurity, conferring also certain supernatural powers.

Other spirits exercising similar powers are regarded by the superstitious classes as of inferior rank, hence the Hindustani proverb, "Ae Mír, bhage Pír."

The behaviour of a person inspired by Míran Jí resembles the 'possession' counterfeited by the low caste Hindu, or the Shaman. Intimating beforehand that at a certain time he will become inspired, and that "Shaikh Sadu Ka Karáhi"[1] will be observed, musicians are engaged, and a crowd of sympathising friends collected. At the appointed time the performer gesticulates, and dances, uttering unintelligible words and disconnected sentences, which are eagerly caught up and interpreted in accordance with the wishes of the audience.

Educated Muhammadans having no faith in this exhibition, denounce it as immoral and unholy, but the uneducated still regard the gibberish of the possessed person with the same awe as they do the unmeaning jabber of the demented.[2]

The Muhammadan revival of the nineteenth century is one of the most momentous events in the modern history of India, not only from its uniting under the banner of a common faith millions of the population, but from its threatening to become a political movement, having for its object the overthrow of the Christian government by a Muhammadan one, with the Koran and the sword as the leading agents of civilisation. The seed sown by a few earnest untitled men, has borne abundant fruit, and at the present day overshadows the whole of Eastern Bengal. To understand how it happened that a movement unsupported by the landlords, or the richer classes, and discouraged by the State, spread far and wide, embracing the large majority of the agricultural and manufacturing classes, it is necessary to go back to the days of the Muhammadan rule and ascertain the state religion at that time, and the means which were adopted to preserve and promote the faith of Islám.

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[1] This entertainment is also known as Baithak.

[2] For additional particulars regarding Shaikh Sadu, see "Qanoon-i-Islám." p 278; "Mrs. Mir Hasan 'Alí," ii, 324; "Roebuck," pt ii, 26 and "Calcutta Review," No. lxvi, p. 295.

The rulers of India were generally Sunnís, and a Shíah was an abomination in the eyes of the bigoted Alamgír. Sunní Nawábs ruled at Dacca from A. D 1612 to 1702, when the anarchy following the death of Aurangzíb, raised the Shíahs into positions of influence, and made them lieutenants of the different Bengal provinces. From 1702 to 1843, Shíah Nawábs resided at Dácca, but, though Shíah in creed, they were obliged to worship in the Sunní mosques, on the two great Îds, and join in the Khuṭba, or prayer for the Sunní emperor. Like the Nawábs of Murshídábád, they had no scruples against employing Sunní servants, or in enlisting Sunní soldiers The Muhammadan population of Eastern Bengal has always been Sunní, and their spiritual leader or Qází, appointed by the Nawáb was also of the same creed. He administered the law as expounded by the Muftí, superintended the education of children, being responsible for the orthodoxy of the religion taught them, and decided all disputes connected with religion, or public worship. Over him was the Qáziyul-qúsát, the supreme ecclesiastical judge of appeal who resided at Delhi.

Again, scattered throughout the country were Naíb, or Deputy Qázís, who watched over the spiritual welfare of the masses, instructed them in the faith, and suppressed dissent, or any expression of independent thought. The power of these officers was great, and equally dreaded by the monarch and people, while their treatment of backsliders or renegades was most summary. The culprit, summoned into their presence, was admonished, and three days given him to recant. If at the end of that time his heart remained hardened, the Nawáb was appealed to, and in most instances death was inflicted. Such cases, by all accounts, were rare, but the fact that this was the law must have had a most wholesome effect in preventing the promulgation of any new doctrines, and in keeping all united in the bonds of a common faith.

The Sunní, however, was no bigot. His religion sat lightly on him, and he participated with the Shíah in his fast and lamentations during the Muharram, as well as with the Hindus in the frolic and license of the Dasahrá and Holí.

In 1765, when the Díwání passed into the hands of the East India Company, a great change took place The Qázís still survived deprived of power; but no longer a terror to evil-doers. They became judicial officers without any authority as religious instructors, or arbitrators. Pírs, faqírs, and Khúndkárs abounded, but their influence was confined within a limited circle of disciples, and did not extend to the densely populated villages of the interior. For three generations, or fifty-five years, the Mussalmáns of Eastern Bengal, being without a shepherd, receded more and more from their national faith, and conformed, as has been seen, to many superstitious rites of the Hindus But one of those movements which seem to occur in the history of all religions, causing the thoughtful to examine the grounds of the popular belief, was about to dawn on the Muhammadans of Eastern Bengal, and evoke a spirit which is not as yet quiescent The first person who stirred his countrymen, by resuscitating the dormant spirit of their faith, was Hájí Sharía'tullah, born of obscure parents, probably Juláhas, or weavers, who resided in a village of Parganah Bandarkhola, Zila Farrídpúr When eighteen years of age he made the pilgrimage to Meccah, but instead of returning, as was usual, he remained a disciple of the Wahábbí leaders then ruling the sacred city. About 1820, after an absence of twenty years, he came back to India a skilful disputer, and a good Arabic scholar On his way to his home he fell among Dakáits, who plundered him of everything, including many memorials of his residence in Arabia, and finding life insupportable without books or relics, he joined himself to the gang, and shared their many wanderings The simplicity of his character and the sincerity of his religious convictions awakened the consciences of these wicked men, who ultimately became his most zealous followers. Such is the story told at the present day of the first step taken by this remarkable man. For several years Sharía'tullah quietly disseminated his new doctrines in the villages of his native district, encountering much opposition and abuse, but attracting a band of devoted adherents, he by degrees acquired the reputation of a holy man.

The chief Wahábbí innovations introduced by him were the non-observance of the Friday prayers, of the two great Îds, and of the Muharram, and he ordered that the titles of Ustád and Shágird, terms which did not suggest complete submission, should in future be used in the place of Pír and Muríd, which had for ages been the respective designations of the master and his pupil He also prohibited the laying on of hands, which was customary at the initiation of a disciple, but required from all, "taubá," or penitence, for past sins, and a resolution to lead a more righteous and godly life for the future It is a curious fact that none of these new ideas excited much opposition, but on his promulgating the dogma that it was a deadly sin, and one derived from the Hindus, to allow a midwife to cut the navel cord when it was the obvious duty of the father to do so, he roused a spirit of revolt which caused many to fall away The Zamíndárs were alarmed at the spread of the new creed, which bound the Muhammadan peasantry together as one man Disputes and quarrels soon arose, and Sharía'tulláh was driven from Nayábárí, in the Dacca district, where he had settled, and returned to his birth-place There he resumed his ministry, and in a short time enlisted the vast majority of the uneducated and most excitable classes of the Muhammadan population His influence became unbounded, and no one hesitated to carry out his orders He acted with great prudence and caution, rarely assuming any other character than that of a religious reformer. The movement originated by this man attracted little attention during his lifetime, and his name is rarely met with in the annals of that day On looking back, however, at his career, there is much to repay inquiry That he, born of poor Muhammadan weavers, amid the swamps of Eastern Bengal, should have been the first preacher to denounce the superstitions and corruptions, which a long contact with Hindu polytheism had developed, is sufficiently remarkable, but that the apathetic and careless Bengali peasant should have been roused into enthusiasm is still more extraordinary To effect this required a sincere and sympathetic preacher, and no one ever appealed more strongly to the sympathies of a people than Sharía'tullah Springing from one of their lowest and most despised classes, his blameless and exemplary life was admired by his countrymen, who venerated him as a father, able to advise them in seasons of adversity, and give consolation in times of affliction

He is described as a man of middle height, of fair complexion, and with a long handsome beard He usually had his head covered with a voluminous turban, and his waist-cloth, worn like a petticoat, was not triced up as it is by Hindus and Muhammadans generally

A very different person was his son, Muhammad Mushin, better known as Dudhu Miyán, who, though of ordinary abilities, exerted an influence far surpassing that of his father His name is a household word throughout the districts of Farrídpúr, Pubna, Báqirganj, Dacca, and Noacolly, and the number of his followers at the present day testifies to the thoroughness of the work that he and his father accomplished.

Dudhu Miyán was born in 1819, and, while still young, visited Meccah, where his followers were taught to believe that visions and revelations of a nature tending to his future exaltation, were vouchsafed to him On his return he devoted himself to the spread of his father's doctrines, and to others which he introduced For instance, he insisted upon his disciples eating the common grasshopper (*phangá*) which they abhorred, because the locust (*fiḍda*) was used as food in Arabia, and vigorously contended that there was no greater difference between the two insects than between the goat of their villages and one from the banks of the Jumna.

The most remarkable advance made during Dudhu Miyán's lifetime was the organisation of a society Following the example of the Vaishnavas, he partitioned Eastern Bengal into circles, and appointed a Khalífa, or agent, to each, whose duties were to keep the sect together, make proselytes, and collect contributions for the furtherance of the objects of the association They further kept Dudhu Miyán, who was usually styled the Pír, or simply Maulaví, acquainted with everything occurring within their jurisdiction, and wherever a Zamíndár tried to enforce his legal rights against one of the sect, funds were provided to sue him in the courts, or, if it could be safely done, club-men were sent to destroy his property and thrash his servants During his father's lifetime the sect had never opposed, or come in contact with, the law of the land, but the high-handed actions of the son united Zamíndárs and indigo-planters against him He tried to compel all Muhammadan ryots to join his sect, and on refusal caused them to be beaten, excommunicated from the society of the faithful, and their crops destroyed The Zamíndárs again endeavoured to prevent their tenants joining, and it is said, often punished and tortured the disobedient. A mode of torture, intensely painful, but which left no marks to implicate any one, is said to have been adopted on both sides The beards of recalcitrant ryots were tried together and red chilli powder given as snuff Coercion, however, failed, and the landholders did little to check the onward spread of the revival

It was among the cultivators and village workmen that Dudhu Miyán gained the largest number of converts. He asserted the equality of mankind, and taught that the welfare of the lowest and poorest was as much an object of interest as that of the highest and richest When a brother fell into distress it was, he taught, the duty of his neighbours to assist him, and nothing, he affirmed, was criminal or unjustifiable, which had this object in view. Enemies in consequence alleged, that witnesses were suborned, and paid for, by the funds of the association

Dudhu Miyán and the Hájís, as his followers were originally called, became objects of dread to the Hindu, old Muhammadan and European landlords. Evidence to convict a prisoner could not be got, and outrages were committed with perfect impunity. It was, however, against the levying of illegal cesses by landlords that Dudhu Miyán made his most determined stand. That a Muhammadan ryot should be obliged to contribute towards the decoration of the image of Durgá, or towards the support of any of the idolatrous rites of his Hindu landlord, were intolerable acts of oppression. In this he was certainly right, as the only apology for their continuance is their antiquity, and adaptation to the feelings of the people But, he advanced a step further when he proclaimed that the earth is God's, and that no one has a right to occupy it as an inheritance, or levy taxes upon it The peasantry were therefore persuaded to settle on Kháç Mahal lands, managed directly by the Government, and thus escape the payment of any taxes, but that of the land revenue, claimed by the State

Dudhu Miyán was constantly compromising himself by the lawlessness of his conduct In 1838 he was charged with instigating the plunder of several houses, in 1841 he was committed to the sessions on a charge of murder, but was acquitted, in 1844 he was tried for tresspass and illegal assembly, and in 1846 for abduction and plunder The riot of 1838 assumed at one time a very threatening aspect, and a detachment of Sepoys was sent from Dacca to quell any disturbance. It was, however, found impossible to induce witnesses to give evidence, and on each occasion he was acquitted At Bahádurpúr, where he generally resided, every Mussulmán stranger was fed, while Eastern Bengal was overrun by his spies, and the interests of the whole neighbourhood were in his keeping. He settled disputes, administered summary justice, and punished any Hindu, Muhammadan, or Farangí, who dared to bring a suit for recovery of debt in the adjoining Munçif's Court, instead of referring the case to his decision. Emissaries carried his orders to distant villages, and his letters, signed "Ahmad nám Ma'lúm," often had the ordinary Hindu superscription to allay suspicion. He taught that there was no sin in persecuting those who refused to embrace his doctrines, or who appealed against the orders of the society and its constituted leaders.

Having broken the law with impunity, Dudhu Miyán took a bolder step Mr. A Dunlop, an indigo-planter of Panch Chur factory in Farídpúr, had for many years been an uncompromising opponent, and several times succeeded in causing the Miyán to be arrested, and tried for illegal actions. The Miyán, bent upon revenge, easily found willing agents to execute his orders. On the 5th of December, 1846, a large body of armed men, attacked and burned to the ground the factory of

Panch Chur After pillaging the adjoining village, they departed, taking with them the Bráhman Gomastha, who was afterwards cruelly murdered in the Báqirgunj district Dudhu Miyán and sixty-two of his followers were tried by the Sessions Judge of Farrídpúr, in July 1847, and convicted, but on appeal to the Çadr Adalat they were acquitted.

In 1857, Dudhu Miyán was thrown into prison, and the story goes, that he would have been released, if he had not boasted that fifty thousand men would answer to his summons and march whithersoever he ordered them.

Several actions of their Pír must have been disapproved of by many of his followers, as, for instance, when he forcibly carried off a Bráhmani girl and made her his "*nikah*" wife, but even this violent act did not cause them to desert him. On the contrary, they believed in him to the last, and liberally spent their hard-earned savings in promoting the interests of the sect At one time a few disciples seceded They had been to Meccah, and ascertained that the teaching of Maulaví Karámat Alí was orthodox, while that of their own spiritual chief was Wahábbí in tendency, and heterodox This secession exasperated Dudhu Miyán to such a pitch that he instructed his people to kill the renegades wherever and whenever found

Dudhu Miyán is described as having been a tall handsome man, with a dark flowing beard, and a large turban wound round his head. He died at Bahádurpúr, 24th September 1860, and was buried there, but the Arial Khán river has, within the last few years, washed away every trace of his house and tomb His wealth, at one time considerable, being expended on lawsuits and intrigues, his family was left poor Three sons survive, of whom none have as yet exhibited any of the energy or abilities of their father. The sect is consequently diminishing in numbers, and many families are yearly joining the next, or Ta'aiyuní, divisions.

At the present day the term Farazí is indiscriminately used when speaking either of the sect founded by Shaiía'tullah, or that established by Karámut Alí, but the Muhammadans of Dacca call the followers of Dudhu Miyán, Farazís, while those obeying the teaching of the Patna school are styled Ta'aiyuní.

While Dudhu Miyán was enrolling disciples in Eastern Bengal, other reformers were stirring up the dormant fanaticism of their brethren in other districts, and the wave passing over the plains of Farídpúr received a fresh impluse from other sources. In 1831 the ex-dakáit, Mír Naçr Alí, better known as Titu Miyán, presided over a band of credulous followers in the neighbourhood of Baraset. Having accompanied Sayyid Ahmad to Meccah, he returned to preach a new creed to the weavers, and other despised classes, in Jessore and Nadiyá, among whom he established the sect known as Maulavís. The chief object of this movement was the rejection of all Hindu rites, and the exclusion of all Muhammadans who refused to embrace the new creed The Hindu landlords had no sympathy with the new organisation. Complaints against the Maulavís being lodged in the Zemíndárí courts, fines were inflicted and generally levied, but on a landlord carrying into effect the sentence of his court, a tumult arose, and the Maulavís rushed to arms These fanatics, taught to believe that Titu Miyán was invulnerable, and that he could give the same charm to his followers, were attacked on the 18th November, 1831, in a stockaded village, their leader shot, and two hundred and fifty prisoners lodged in Alípúr Jail This local disturbance being effectually put down, nothing more was heard of the sect.

Far more important, however, than the revival begun by Sharía-'tullah and Titu Miyán, was that initiated by Sayyid Ahmad at Patna, in 1820 At first this new association claimed to be identical with that started by Sharía'tullah, but it was soon apparent that their aims were different and antagonistic Both concurred in repudiating the numerous superstitions observed by all classes of Muhammadans, but the Ta'aiyuní, or Patna sect, introduced many innovations unknown to the followers of Sharía'tullah and Dudhu Miyán By the Arabs, as well as the Ta'aiyuní, the Farazís are known as Wáhábbís, a name, however, repudiated by all but the extreme party, called Kafi'yadain.

The first preacher (*wá'iz*) of the Patna school who visited Eastern Bengal, was Muhammad Ali, a Khalífa appointed by Sayyid Ahmad, whose censures were chiefly directed against the practice of Hindu superstitions. He forbade the reading of the "*fátiha*," or prayer for the dead, the offering of "*shírní*," or sweetmeats, at the tombs of holy men, and the use of music at weddings The next was Wiláyat Ali, one of the four original Khalífas chosen by Sayyaid Ahmad at Patna, in 1820, His opinions were still more pronounced, and more deeply tinged with Wahábbí formalism. For example, he enjoined the frequent raising of the hands, and the utterance in a loud tone of voice of the word 'Ámín' at the end of each prayer. He also maintained that the Hadís, or traditionary sayings and doings of Muhammad, contained authoritative instruction on many points, being only second to the Korán in value

The most successful and celebrated missionaries, however, were Maulavís Karámat Ali, Zain-ul-abadín, and an Arab, Sayyid Muhammad Jamál-ul-lail, whose preaching among the villages of Eastern Bengal has had the most momentous effects, not only by uniting under one banner the vast majority of the middle and working classes, but also by arousing the intolerant spirit of Muhammadanism, which had lain dormant for nearly a century

Little is known regarding the history of Zain-ul-abadín, but of Maulaví Karámat Álí, who died in 1874, full particulars are available. He was the son of the Sarishtadár of the Jaunpúr Collectorate When sixteen years of age, he studied under Maulánáh Ábd-ul-Ázíz of Delhi, and afterwards under Ahmadúllah, a famous teacher of Jaunpúr. Excited by the preaching of Sayyid Ahmad, he followed that remarkable man to Calcutta, became his disciple, and accompanied him to Meccah. On his return he proved himself one of the most valuable deputies of the Patna mission.

Sayyid Muhammad Jamál-ul-lail fled from Madínah, because his father insisted on his marrying an Arab damsel He came to Dacca about 1843, and joined with Karámat Ális in disseminating the new doctrines Although ignorant of Bengálí, and hardly acquainted with Hindustani, his commanding figure, luxuriant beard, and voluminous turban were, in the eyes of the ignorant villagers, credentials of his sincerity and capacity, and soon attracted to him a numerous circle of disciples. He married Bengali wives, one of whom, a resident of Dhámrái, possessed a considerable property. In 1854, incensed by the peculations of the Amlah, he decided, contrary to the wishes of the other shareholders, to collect the rents himself His opponents assembled club-men and tried to capture him, but, boiling with anger, he rushed within doors, seized a gun and wounded several of the assailants For this offence he was tried, and sentenced to seven years' imprisonment in the Rájsháhí Jail On the expiry of his term he returned to Dacca an altered man, much broken in spirit He died in August 1872, and was buried in the village of Naichabandtolá, opposite Dacca His cousin, Sayyid Muhammad Hásham, or Arab Çahib, as he is familiarly called, still trains disciples, and propagates the same religious creed as his predecessor.

The doctrines taught by these later Khalífas differed materially from those of Muhammad Álí Wiláyat Álí. The former held that the Hadís, a human compilation, and therefore full of errors, could not be considered an infallible guide; but admitted that the teachings of the Imáms, as contained in the Fiqhá, or practical jurisprudence, were binding, although contradictory passages, and a diversity of doctrines, could be found in them These defects were not, they argued, so vital, nor the tenets grounded on the various readings so absolute, as to justify Muhammadans in breaking asunder the bonds uniting the world of

Furthermore, these reformers denounced the employment of music at weddings, as being a sensual and discomposing pleasure; the offering up of the "*fátiha*" at the grave of deceased relatives; and the worship of Pírs, and other saintly personages

These opinions regarding the Hadís and Fiqr had always been held by the Muhammadans of Bengal, but the assertion that music was immoral, and that the "*fátiha*," as well as the becoming veneration of Pírs, were sinful, roused much opposition, and gave rise to a learned, though idle, discussion.

In later years Karámat Ali made the important admission, that India under the English rule, was not Dár-ul-harb, a country where the infidels were the legitimate objects of attack, as had been maintained by Dudhu Miyán and Wiláyat Alí.

The principal doctrines of these reformers being founded on the fundamental truths of Islám, excited at first no little surprise, as they had been lost sight of by the Hinduised Mussulmáns of Bengal

According to them, man, by nature feeble and prone to evil, cannot without assistance learn to know God or obey His commands Muhammad is the only true mediator between God and His rebellious children, but the holy men of past ages possess a certain limited power of obtaining pardon for the penitent. It is therefore regarded by the Ta'aiyuní as a meritorious act to make offerings, or *Li'llahí*, at the graves of saints, in the name of God, as they believe that the supplicant, being moved by the associations of the place, prays with greater sincerity and fervour

The custom, however, observed in Bengal for ages, of presenting bread to the manes of ancestors on the Shab-i-barát, and of making offerings at the tombs of deceased relatives and friends on the fourth, tenth, twentieth, and fortieth days after death, were denounced as deadly sins In their stead, the relatives were instructed to employ a Maulaví to visit, twenty-one days after the funeral, the house of mourning and perform the service called Niyázulla, or thanksgiving to God, consisting of few a passages from the Koran, or Khatm-ul-Ambiya, in a chamber fumigated with sandal-wood and frank-incense.

Although the lamentations and singing, the Ta'zias, and the noisy pageantry of the Muharram, are reprehensible, the Maulavís recommend their disciples to fast and spend the tenth, or *Shahádat ka roz*, in religious exercises, as a devotional act.

The Shab-gashtí procession, with its discordant music, its frolics and license, no longer traverses the streets, having been put down by these puritanical teachers; and Muhammadan marriages (Shar'í-ul-Shádi) are now dull and uninteresting ceremonies No music, or dancing, is allowed, and only a few relatives witness the marriage The bride is no longer adorned with garlands of flowers, the Kandúrí ceremony is omitted; and the "*Marocha*" not constructed The marriage service is performed by a Qází or Maulaví, and a Ḳábín, or marriage settlement, is drawn up

The only festivity allowed is a feast, or Walíma, given on the marriage day, or on one of the two following days, and to which the relatives, the headmen of the village, and of the trade, are invited.

The superstitions connected with the birth of a child have also been pronounced sinful On the fortieth day, when the mother becomes ceremonially clean, the husband makes ready the thanksgiving feast, called Aqíqa. Two he goats (*khaçí*) are offered for a male child, one for a female, which, like the sacrificial goat of the Íd-ul-qurbán, must be without spot or blemish. The offering being regarded by some as a propitiatory one (*sadqa*), the flesh is distributed to faqírs, but the majority look upon the occasion as a social feast, at which relatives and friends meet to enjoy themselves. The victim is slaughtered by a Mullá, the bones and offal being buried, while the skin is given to any beggar. The father, mother, grandfather, and grandmother of the child are strictly forbidden to taste the flesh of the sacrifice.

The Ta'aiyuní observe the five daily prayers, and before each they clean their teeth with a piece of stick (*miswák*), rinse their mouths, and wash their hands. They strictly observe the "Jum'a namáz," or Friday-prayer, in the public mosque, which the Farazís and Wahábbís dispense with, and before leaving their homes it is customary to shave, bathe, and put on clean garments The stricter members also observe the "*tahajjud*," or prayer at 3 A M

The Ta'aiyuní, furthermore, dresses differently from any other Muhammadan His loins are ungirded in expectation of the advent of the long-looked-for Imám Mahdí, and, instead of the ordinary waist-string, or *kardhaní*, he wears a leather strap (*tasma*) He is also enjoined to allow his beard to grow, and to wear his hair long, or, better still, to shave it entirely off, and is forbidden to eat food off a golden or silver dish, or to touch with his lips the mouth-piece of a tobacco-pipe mounted with silver Further, he must not pray in silken garments,[1] as was often the custom formerly, but in cotton or woollen attire.

Women are as punctilious as men, especially in attending to the regular prayers. Of late years they have laid aside the graceful *sárí*, and adopted a jacket with long sleeves, which does not add to their comeliness, and, still more important, is not admired by females of other classes. They also object to staining their feet and nails with henna, or "*mehndí*," as is done throughout most parts of Muhammadan Asia.

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[1] The cloth, called Mashrú', made of silk and cotton, in which a Muhammadan may lawfully pray, is not worn in Bengal.

Another usage has had a most important bearing on the business habits of this class of Muhammadans. Interest (*súd*) is denounced by the Maulavís, and as large profits (*manáfí*) are legitimate, among them are found great traders in jute, hides, rice, and country produce generally, who never join with professional bankers, or money-lenders, unless they agree to division of profits instead of a certain rate of interest When giving an advance of money, it is usually stipulated that the sum shall be repaid within a certain period, and that an eighth, or fourth, of the net profit shall be paid to the lender, in addition to the principal.

By this arrangement the lender often receives more than the market rate of interest, but if the payment be delayed nothing additional is gained. This system of profits, however, is virtually interest under another name

Strange to say, the reformed Muhammadans of Dacca still cling to many Hindu superstitions, in spite of the denunciations of the Maulavís They wear amulets (*ta'wiz*) containing a sentence from the Koran, and place implicit trust in earthen platters, inscribed with holy texts and hung up over their doors, or arround their villages, believing such objects to be more efficacious against epidemics than the sanitary skill of the Yunání or European physicians Again, when small-pox attacks their families, Sítala is worshipped with as much faith as is shown by the Hindu Málákárs, and in 1874, when the disease was present in their villages, a "*ghat*," daubed with red-lead, on which a cocoanut and plantains were placed, stood in every house They were determined opponents of vaccination, but occasionally have their children inoculated with all the mummery of the Sítala Pujah

Under pretence of greater sanctity and stricter orthodoxy, they unconsciously practice many other Hindu usages thus, on touching a Christian they bathe, on his entering their houses throw away all cooked food or drinking water Their immaculateness, however, is not soiled by contact with a Hindu of the vilest class, or by his presence within doors. It is the Wáhábbí who, with perfect consistency, treats Hindus and Christians with equal repugnance.

It would not be unreasonable to infer that the promulgation of these new puritanical doctrines would produce a corresponding improvement in the character of the members, but according to the best authorities, the Maulavís, no change is as yet visible. On being asked if the Muhammadans of his sect oftener spoke the truth than those of the old school, a Maulaví replied,—that the latter lied, being ignorant of the moral turpitude thereby incurred, but that the former, who were able to distinguish between what was right and what was wrong, uttered falsehoods more circumstantially and glibly. There can be no doubt that the Ta'aiyúní inhabitants of Dacca are more addicted to drink than the old Muhammadans. An amusing scene was witnessed in 1874, at the Pancháit of one of the most bigoted quarters of the city, which had been summoned to try a young man for drunkenness and creating a scandal The evidence was overwhelming, and the culprit was sentenced to receive twenty-five blows with a shoe. He claimed the right of replying, and, without attempting to extenuate his crime, pointed out that, if consistent and impartial, the meeting should inflict the same punishment on his boon companions. This was addmitted, when he enumerated the sons of all the leading members present, and stated that he was prepared to prove their complicity in drinking spirits. The assembly was hurriedly dissolved, and the young man escaped the punishment he so richly merited.

The Ta'aiyuni differ in many important respects from the Farazí and Wahábbí. They not only regard the Friday-prayer with peculiar reverence, but often make it, like Sunday in Europe, a day for popular demonstrations and for forming combinations against the Zamindárs The Patna Khalífas' have always pretended that this movement was identical with the Farazí, and on the strength of this identity extracted money from the ignorant peasantry, who were also induced to leave their homes and join the Sitana Colony But from time to time a few returned, and having confessed that the subscriptions went to support a delusive cause, the enthusiasm gradually died away.

There can be no doubt, however, that much secret disaffection, fostered by fanatical Khalífas and Maulavís, still exists in the ranks of the sect but it is generally said that subscriptions are now unwillingly paid, and fewer recruits drafted to the North-West frontier than was the case ten years ago.

The foregoing is a simple but correct sketch of the Muhammadan religion as found in Eastern Bengal at the present day.* Islám is there passing through a period of trial, and seems in danger of being split up into rival creeds, unless injudicious interference on the part of the Government causes it to unite against a common enemy. But, in absence of any provocation, it is likely that jealousy will increase, and the two most important divisions, the Sábiqí and Ta'aiyuni, learn to hate each other as brethren of different beliefs always do. As the new school is of more progressive tendency it will probably assume the offensive, and owing to its numbers, silence dissent, as well as all expression of independent opinion. The Sábiqí are disunited, without any organisation, but the Ta'iyuni, under the guidance of able leaders, are bound together by the ties of a widely diffused and powerful society. The former, again, are friendly to the English Government, the latter, at heart estranged, do not dare to show themselves hostile.

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* Fifteen or twenty years ago—*Ed.*

As the religion of the Muhammadans of Bengal has become corrupted by the adoption of many Hindu superstitions, so it will be found on further enquiry, that the professional and labouring classes have also introduced many innovations derived from the same source.

In each Mussalman "*qaum*," or class, there is a Pancháít of elders, by whom matters affecting the interests of the trade, or company, are discussed, and all offenders against their unwritten laws are summarily dealt with

In every Muhammadan village, or quarter of a town, there is another, and equally efficient, court of arbitration. In Dacca, there are twenty-two of those Pancháíts, each consisting of from five to fifty members, and often including Hindus of respectability, and liberal views. A Pancháít is presided over by a Sardár, or Mir Mahalla, under whom there is at least one Naib-Sardar, or deputy, a Sákhí-dar, literally one who gives evidence, and a Gorait, or messenger

The post of a Sardár is hereditary, and when old or disabled by sickness, he must vacate in favour of his son The position is no *sinecure*, as his duties are multifarious, for all deaths, births and purposes of marriage are reported to him. He summons the Pancháít, gives directions about funerals, arranges the marriage ceremony, and settles what subjects are, or are not to be laid before the court. In all domestic and private quarrels he is consulted, and in charges of assault, or crime generally, full details are submitted for his decision. His orders being absolute, the fines are always paid. When the court assembles, he submits to it the business for which it was summoned, points out the proper course of action, and, if a conclusion cannot be arrived at, he appeals to another Pancháít, which re-considers the matter and records its decision, which must be accepted The Pancháít always meets in the evening, and when the court is dissolved a feast is given, at which the Sardár receives two shares of the food, one of which he eats, the other he sends to his family.

In cases of notorious drunkenness, or great immorality, remonstrance having failed, a very severe punishment, called "Nal-páni-bándhna," is inflicted, by which the delinquent is ostracised, and no one will eat or smoke with him, or even permit him to enter or sit down in their houses. Relatives must banish him from their society, and if he die impenitent no one dares to bury him Life under such circumstances becomes insupportable, as the punishment is greater than can be borne.

In most instances the offender aknowledges his transgression, and, after paying a heavy fine, is re-admitted into social communion.

The Sákhí-dár is the servant of the Sardár, and receives at feasts a double allowance of food. When a death occurs in the quarter information is given to him, and a fee of four annas paid, and when a marriage is contemplated he receives four annas, and a handkerchief in which a betel-nut is tied. A piece of the nut he delivers to each member of the Panchâit, as an invitation to the marriage feast.

The Gorait, again, is merely the messenger of the Sákhí-dár, and he receives as pay one-half of the fees collected.

When a girl is married nothing is given to the Pancháit of her quarter, or village, but when a boy goes to another quarter, or village, he pays one rupee to the Pancháit, one rupee to the mosque, and one to the Zamíndár of the land on which the bride's house stands.

Such is the autonomy of Muhammadan citizens. Though a copy of the Pancháits and Dals of Hindu castes, it is far more liberal, being established, not so much for selfish or sordid advantages as for the common welfare of the citizens. The court is thoroughly secular and republican, the opinion of each member carrying equal weight, although that held by the president is generally followed. These Pancháits possess great influence among the people, and in Farazí villages, as they take cognizance of all offences, it is exceedingly rare that any case of violence or assault, committed within them, finds its way into the regular courts.

The Muhammadans of Bengal have followed in many respects the system of caste as practised by the Hindus, although the principle that a son must carry on the trade or occupation of a father, has never been reduced to a formula. Still, they have placed many honest and useful handicrafts under a ban, while others of a more objectionable nature are reckoned honourable.

The most respectable occupations are those of the Darzí, Jildgar, Júti-wálah, Nánbái, Naicha-band, Patwá, Rangrez, and Rafúgar; the most dishonouring, those of Bájunia, Beldár, Chamra-farosh, Dhobí, Dhuniyá, Juláha, Kalwár, Kolu, Kútí, Mahi-farosh, and Nílgar.

The learned professions, such as the Hakím, Háfiz, Khwándkár, Maçawwir, Mulla, and Munshí are respected by all classes, and few deserving students or scholars ever want for patronage or encouragement. The chief reason why one trade is accounted less reputable than another is, that the most honoured were originally Muhammadan, the despised ones, Hindu. The eight trades mentioned as honourable provide for wants which were secondary in the eyes of the Hindus. The trades of the tailor, book-binder, shoe-maker, baker, and darner, unknown in Bengal, when Muhammadans first settled there, were necessarily followed by their own countrymen from Upper India, and therefore did not entail any disgrace or degradation. A position being thus secured for these tradesmen, it was in vain that those who engaged in new occupations strove to acquire rank and privileges disallowed by the older conservative bodies. This struggle of exclusion on the one hand, and of admission to equal rights on the other, is still eagerly contested by the various parties.

The avocations of the musician, delver, washerman, fishmonger, and indigo-dyer, formerly pursued by outcaste Hindus, were subsequently adopted by poor Mussulmáns, or by converts to that faith, and have consequently remained inferior ones The hide merchant, cotton-carder, Jamadání weaver, distiller, oilman, and Kútí, who follow occupations new to the Hindus, are for the same reasons outcaste. The bigotry and intolerance of the Chamṛa-farosh and Kútí are so remarkable as at once to excite suspicion of their recent conversion, while the low estimation in which they are held by other Muhammadans can only be accounted for by this fact.

The different stages through which converted Hindus pass before they gain a position of thorough equality with the old Muhammadans can be traced at the present day. The Bediyás were outcaste Hindus thirty years ago, but a Mulla now ministers to them, circumcision is practised, the Ramazán fast is kept, and the regular prayers offered up, but they cannot enter the public mosque, or find a resting-place in the public grave-yard. From a social point of view they are still aliens, with whom no gentleman will associate or eat. The treatment of the Chandál by the Súdra is in no respect more rigorous, or harsh, than that of the Bediyás by the upper ranks of Muhammadans.

The Kútí, again, have advanced a stage farther, being not only the most dogmatic, but also the most sanctimonious of their faith. The mosques, only open to them within the last few years, are now held and managed by their leaders, who decide what persons are, or are not, entitled to worship in them.* Beyond this, however, the division has not made any stride No Muhammadan of good family will intermarry with them, or eat from their dishes; but the ordinary burial service is performed at the Masjid, and the dead are permitted to lie in the public cemetery.

The previous sketch has shown us that the religion, customs, and social divisions of the Bengali Muhammadans are deeply tinged with Hindu superstition. It remains to be proved that the Muhammadans, as individuals, bear much resemblance to their Hindu fellow countrymen.

The educated Muhammadan, being of liberal ideas, respects all religions, despising none, and sympathises with sincere worshippers of God, wherever found, although convinced that he is the heir of the latest and best revelation The Arabic and Persian classics, containing as he thinks all that is worth knowing, are his daily study; but he neither reads modern literature nor sends his sons to the public schools, as both are considered to favour infidelity and scepticism. Science is a sealed book which he has no desire to open, while English and Bengali are foreign languages to him. He attends to his religious duties, observes the fast of Ramazán, and dispenses charity freely and unostentatiously. His anxiety to preserve the family-name untarnished is a ruling passion, often carried to extremes Not only does he scorn to tell a lie, or perform a mean action, but he will rather lose a law-suit than appear before a magistrate of low birth. Inferior to the Hindus in chicanery, he can, if driven to it, wield the same weapon, and make a determined, if not always successful defence To the poor he is kind and considerate, many charitable actions being done in private for which he gets no credit. He visits the sick servant in his hovel, sending him food and sherbet prepared in the zanánáh, and helps poor students by providing lodgings as well as paying a Munshí to instruct them. In the society of strangers he is polite and lavish of praise; but he seldom visits, sits at the table, or partakes of food with Christians, as was the invariable custom a century ago. It is melancholy to contemplate the present state of the better classes of Muhammadans, for with many excellent traits of character, they have no energy or ambition left Instead of adapting themselves to the changes of modern civilisation, they listen to tales of ignorant faqírs, or to sedition taught by fanatical Maulavís, and lament that the days of 'Alamgír and of Mussalmán supremacy have passed away. The young are growing up in idleness and ignorance, the old wasting their lives by debauchery, intemperance, and opium. The establishment of a Madrasah, or school, managed by Muhammadan gentlemen, will in time exert a beneficial effect, but the fear that the rising generation will resemble "Young Bengali" keeps many from sending their sons to it.

The vast majority of Bengali Muhammadans are ignorant and simple peasants, who of late years have been casting off the Hindu tinsel which has so long disfigured their religion. They are now taught that to be good Mussulmáns nothing more is necessary than the repetition, at stated intervals, of certain prayers in a language they cannot pronounce, still less understand. In many places it is difficult for the ryots to find a person capable of conducting the services of the congregation. In 1874 the inhabitants of several villages assembled on the banks of the

Lakhya to celebrate the Baqr-'Íd, but their being no one present who could lead the worship, a Dacca youth, aged twenty, who was passing in a boat, had to land and recite the usual prayers

Formerly the peasants respected Bráhmans, and attended many Hindu ceremonials now prohibited; but the Farazí Maulavís have denounced the contribution of anything to the annual festivals, although unable to stop the payment of extra rent in place of the Párvana, or impost levied to defray the cost of religious ceremonies.

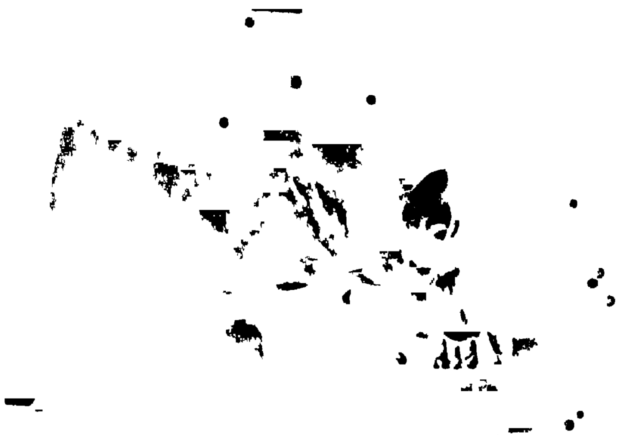
The peasant is not only litigious, and very unreasonable when his interests are touched, but easily persuaded to join in combinations against his landlord, and in so doing often falls into the snare set by designing men. Industry and frugality are common virtues, and though the wife is treated as a slave, she is never ill-used, while towards his children much affection and indulgence are shown Strangers being regarded with suspicion, a simple question rarely receives a straightforward answer The most attractive feature in the character of the ryot is his hospitality and charity The beggar always receives a copper, or if the meal be ready the poorest wretch is invited to partake of it, and on leaving, dismissed with a blessing The house may be small, but the vagrant finds shelter therein

It is to this national weakness that Bengal owes the existence of so many sturdy mendicants, who, wandering from one hamlet to another, find some kind hand to feed and shelter them

The Mussulmán is less sociable than the Hindu, and now that music has a ban laid upon it, he can no longer join in parties given by his Hindu neighbours Boys of both creeds play together, and when grown up, often become attached friends It is not uncommon for the Muhammadan to share the joys and sorrows of his Hindu friend, and pay the compliment of naming a son after him

One of the most characteristic foibles of the Bengali peasant is vanity, leading him to wear embroidered garments and caps, and carry—in his eyes is the modern emblem of gentility—a cotton umbrella!

On the whole the peasant is a happy and contented man, unless the plausible theories of the Maulavís induce him to join in agrarian disputes and combinations so common at the present day. Nothing will make him leave the home round which his affections cling, unless injustice and a long course of illegal exactions, by rendering life intolerable, force him to seek for peace under a less extortionate landlord. The Churs, or alluvial islands, along the Ganges and Meghna, are the favourite retreats of Farazí ryots, and the lands being managed directly by Government, and not by any Zamíndár, or Middleman, the arbitrary taxes sanctioned by the ancient customs of the country are no longer collected.



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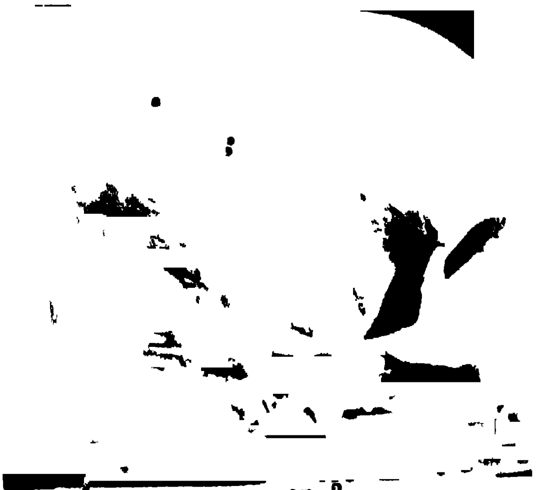

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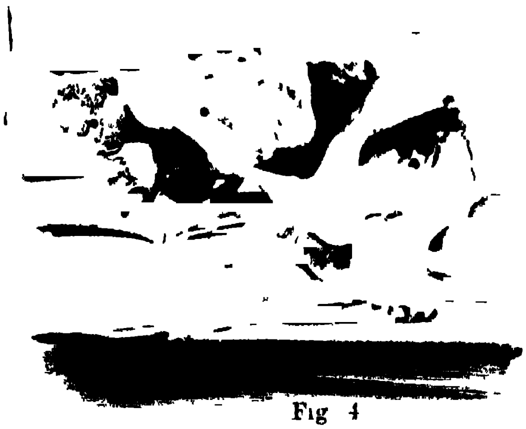

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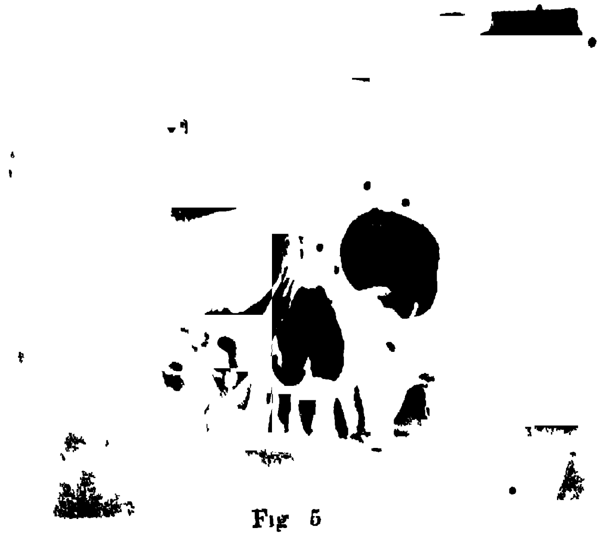

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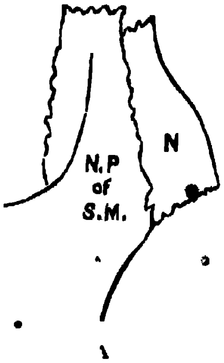

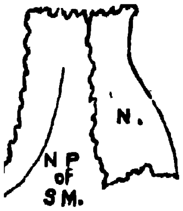

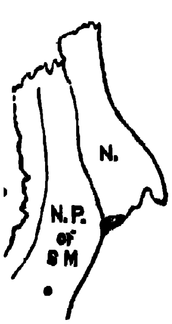

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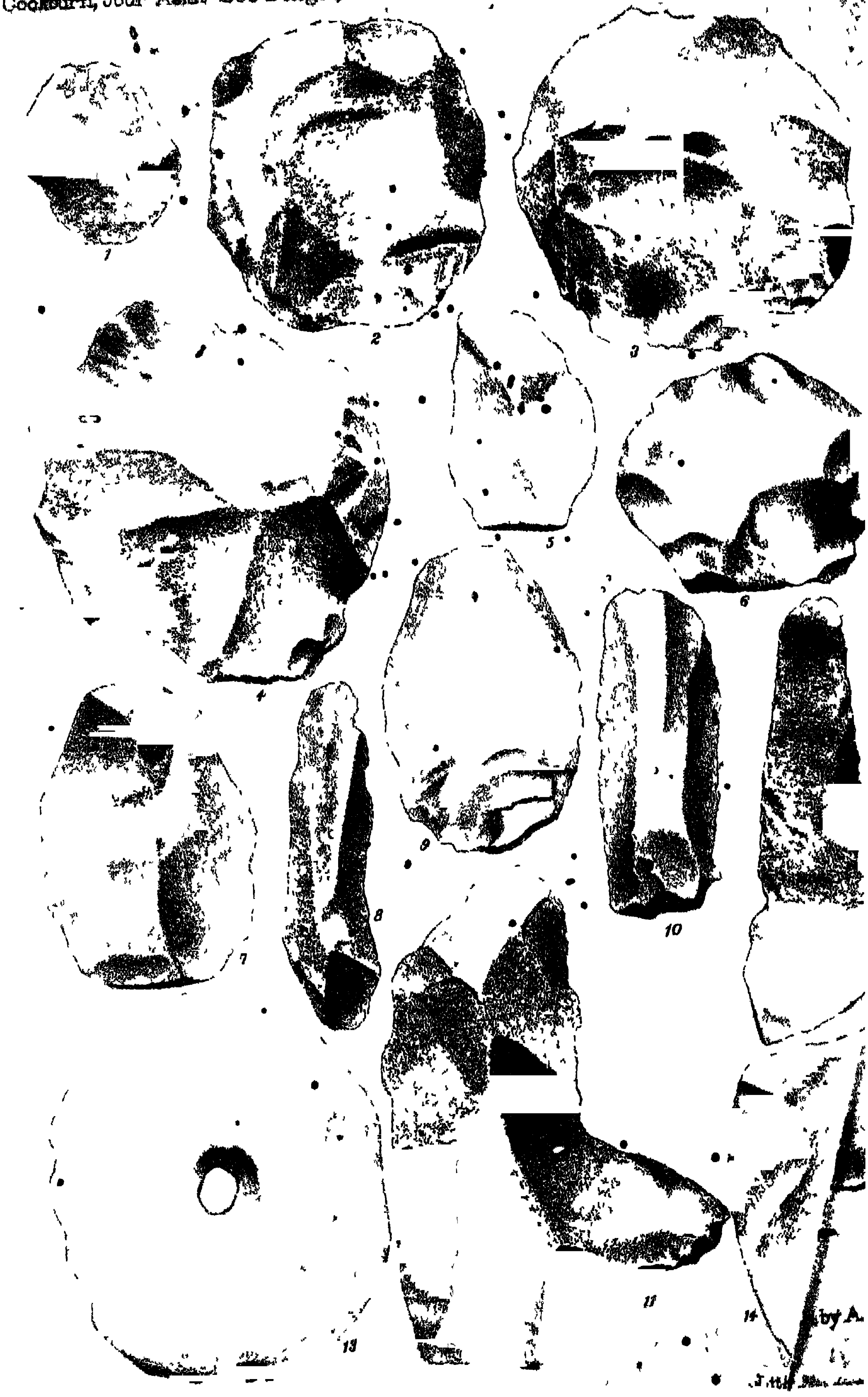

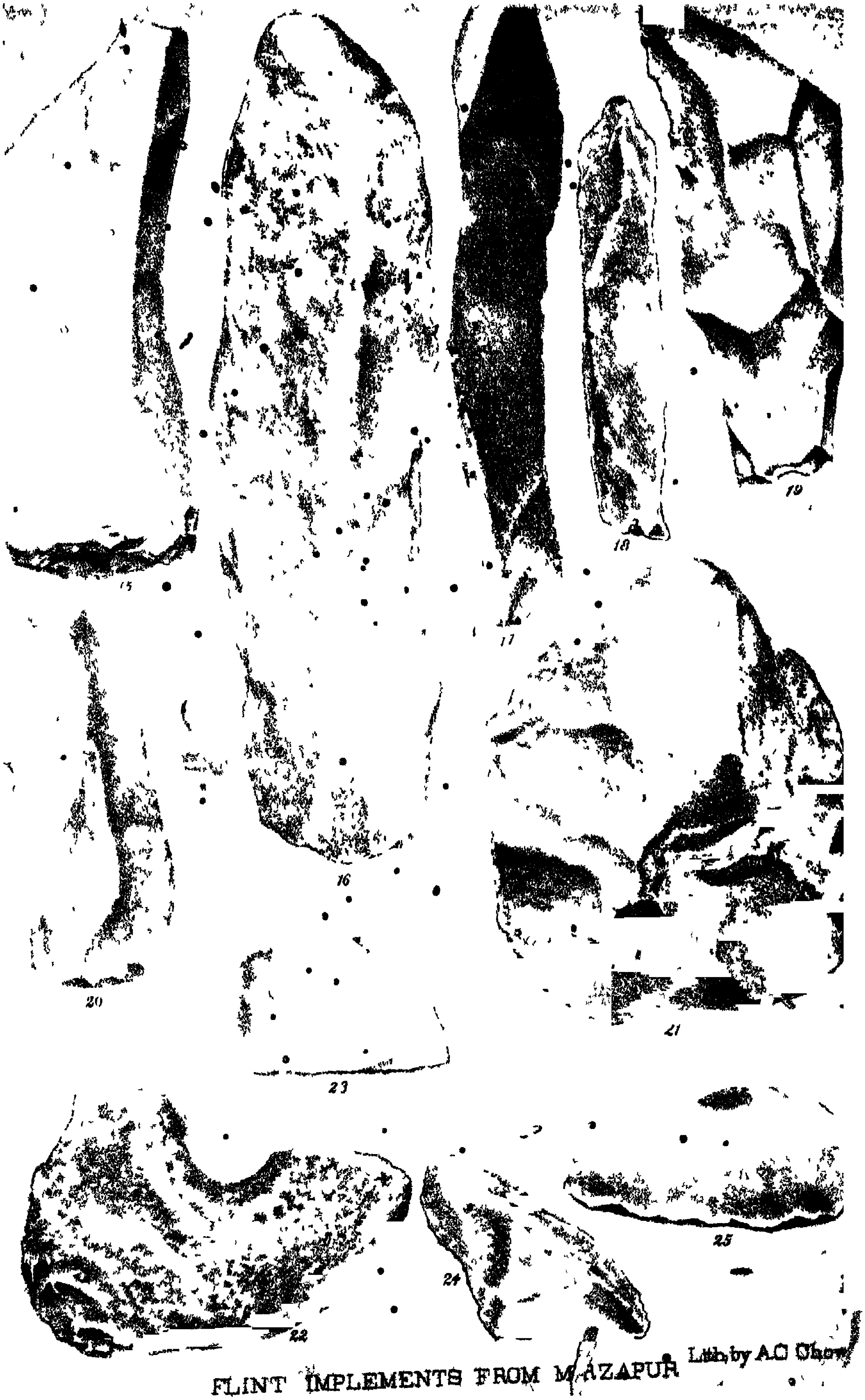

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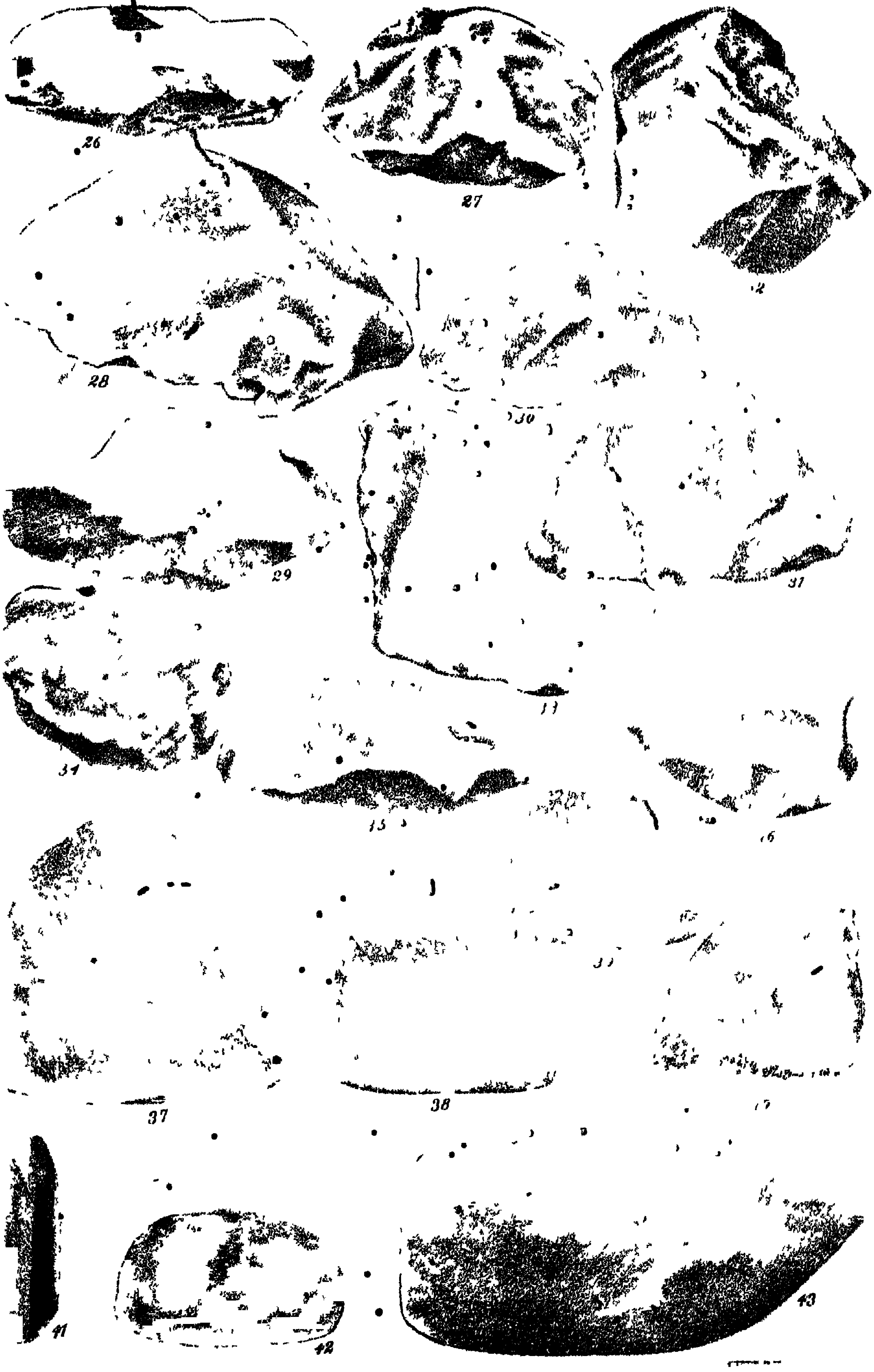
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